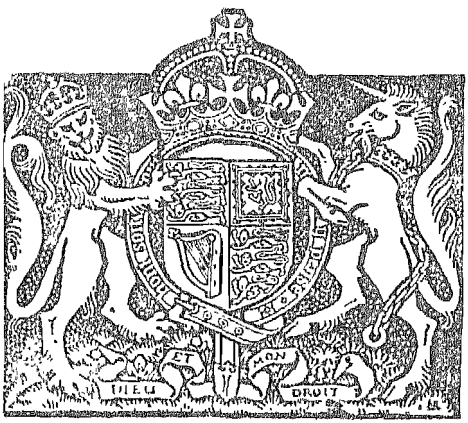

PLANTS WITH PERSONALITY

By the same author

MOUNTAINS OF THE MOON

BORNEO JUNGLE

(with Tom Harrisson and others)

PATRICK M. SYNGE

PLANTS WITH PERSONALITY

Illustrated with Plates from
Dr. Thornton's Temple of Flora
And with Drawings by
JOHN NASH

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TO
SELWYN
an enthusiast for plants

"I have often", says the elegant St. Pierre, "been astonished at our indifference respecting the applause of those who have introduced useful plants into their country, the sight or fruit of which are to this day so delightful. The names of these public benefactors are chiefly *unknown*, whilst their benefits pass from generation to generation, whereas those of the destroyers of the human race are handed down to us in every page, as if we took more account of our enemies than our friends. The ancients did not, however, act in this way. Plutarch observes that Ceres and Bacchus, who are mortals, attained to the rank of *Gods*, from the universal and everlasting blessings, which they procured to mankind.

From Dr. Thornton's *Temple of Flora.*

CONTENTS

ILLUSTRATIONS

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ACKNOWLEDGEMENTS

THE AUTHOR regrets that, owing to war service, he is unable to thank individually the many friends and advisers who have helped him over this book. He would, however, particularly like to acknowledge the invaluable help of Mr. W. T. Stearn of the R.H.S. library. Mr. Clarence Elliott has kindly written to him specially concerning the discovery of *Puya alpestris*, while his friend, Selwyn Duruz, has read the proofs. He is indebted for the prints reproduced from the *Temple of Flora* to Messrs. Michael Williams of Curzon Street and Messrs. Dulau of Dover Street. He regrets that it is not possible for him under the present circumstances to compile the full bibliography which he had intended, but if any reader cares to write to him, care of The Publishers, concerning references relating to any particular plant or chapter, he will be pleased to give any help he can. Further details and illustrations of Nepenthes can be found in *Borneo Jungle*, (by the author, Tom Harrisson and others), while many of the giant Lobelias and Senecios found on the Equatorial mountains of East Africa are illustrated in *Mountains of the Moon*.

INTRODUCTION

TO WRITE of reality, of living people and a daily trivial round, or to write of escape into a world of fantasy peopled with strange figures, strange birds and strange plants. It is of the strange plants that I would write to-day, plants which inhabit this world, but still are not completely of it, plants which are strange and exotic and betray very clearly their relationship with the eternal, with senses and sensations outside our normal perception.

They are the plants which are the savour of the garden world even as genius is the savour of the world of men. We can give names to the plants but we can no more understand them or even their effect on us than we can understand our own minds. Only the plants are permanent and in most cases we can all grow them; but no matter how many of us grow them, they will still retain their magic, be they as common as the buttercup or the dandelion. Here is reality combined with romance and escape, escape into a world of great forests and high mountains where is their original home and therefrom into all the worlds that the mind may

construct for itself; and surely it is one of man's most pleasant occupations to meditate and construct fantasies in his mind. In that lies their value. They live, they grow, they are real; yet they are something more than real and we can all see it.

All plants attract me. All plants have beauty, but there are nevertheless some whose beauty makes such a violent impact on my mind that I regard them as definite personalities. They are the true exotics. To my mind the word exotic does not necessarily imply a stove plant or even a greenhouse plant but merely a strange plant with a personality. They are the kind of plants which get me out of bed half an hour earlier in order that I may see whether their flowers have opened, the kind of plants which I would gladly cross half a continent to collect, the kind which flower and in their flower-life, fill for a moment that emptiness which we all have in our lives at times, and give us a brief understanding of the all in all, the eternalness of beauty and truth.

What is it that gives certain plants this extra thrill in my eyes and can I transmit this to you? It is very difficult. So far I have only known one man who could transmit this charm in his writing of flowers and that was Reginald Farrer who made extensive journeys in the mountains of China and the Eastern Himalayas to collect plants and loved them so much and introduced so many good things to our gardens. In the numerous *Farreri's* lies his immortality. His writing while precise and accurate had yet a certain

oriental voluptuousness which was characteristic of the plants he described and it rings so sincere that immediately you long for them. The charm and beauty of a flower is such a complex thing, all the unity that is in the world and all the diversity and that extra spirituality, which the mystics have experienced and called God for want of a better word—and a better world. It takes us out of this world and reminds us that there are still things that men don't understand. We have advanced enormously in our knowledge of mechanics and in purely mechanical triumphs over nature, but there has been no comparable advance in the realm of the mind, in human conduct or in the understanding of beauty. So much so that many writers and painters are sick of the very word.

There has, however, in recent times, been a steady advance in the importance in the lives of many people of plants and animals and everything that is classed as natural rather than human or mechanical. The town dweller seeks the peace of the country in vast numbers every week-end. There are probably more keen gardeners in England today than ever before. Plants are the ultimate source of all our food and our being in their conversion of the carbon-dioxide and oxygen of the air, the water and salts of the soil into living green tissue, starches and sugars which we can eat. A world in which we could live without them would be inconceivable even with all the developments

of modern science. To the majority of any people, civilized and uncivilized, plants represent a very real force in their lives, perhaps even a greater force than the political conditions under which they live, provided that they are living above an economic minimum and are not bothered with military service or war.

At the present moment a cloud of fear is hanging over Europe, a fear which pervades every household and every face. It is especially in such times that men need to turn to plants and natural conditions and they can derive satisfaction from the unchanging cycle of nature through the seasons, and the fact that spring follows winter whatever man may do.

This book pleads primarily for a greater understanding of plants in general and especially exotic plants, but through that greater understanding it also pleads for a greater understanding between men and countries, for a policy which will allow all nations to live as friends and for turning the minds of people away from war to the thrills and satisfactions that can be experienced in such peaceful and also international occupations as growing plants. The Romans believed, when times are bad, give plenty of circuses; I say now when times are bad, let there be plenty of flowers, let the land of England be cultivated as never before and covered with blossom. Let food and flower grow hand in hand over the land and let us plant finally all our

spare land, which is neither wild nor beautiful but merely derelict and untidy. There is much too much of that in England while there are still too many people underfed and far too many people who get little opportunity to derive joy from flowers and growing plants. And let those who already grow flowers, grow more flowers and finer flowers and exotic flowers, plants with personality, but not forgetting our fine native trees and plants many of which have lots of personality and are specially suited to the environment.

Some of the plants described in this book are hothouse plants, but the majority are not and are well within the reach of every amateur in the country at prices well below a guinea each and often only a shilling or so. A few only are still collectors' novelties, but for these I hope for a wider distribution. The veriest novice can grow *Iris stylosa*; it only needs to be left alone, does well in a poor soil, preferably but not necessarily against a sunny wall; but what a wealth of beauty it gives us during the winter months when flowers out doors are scarce.

Again this is a personal book, the plants in it are all ones which to me are strong and definite and exciting, but again tastes differ; so many of your favourites may be left out. Space also is limited. Almost every time I travel abroad or visit a fine collection of plants I see flowers which make a deep impression on me and which I should like to include. But though many of the plants I mention are so

easy to grow, they are still not plants that you will see in the gardens of all your neighbours. If you grow them you will always have the thrill of possessing and being able to show with pride something different and something fine.

There are many fine and most distinctive plants under the genera Rhododendron, Meconopsis, Primula and Nomocharis, but I have decided for the most part to leave them out of this book. They are plants which I have never been able to grow with great success in the hot sandy soil of my present garden. So I have never explored their deepest mysteries, although I have toyed with and always desired such beautiful plants as *Primula Winteri*, with its powder sprinkled leaves and blue flowers so early in spring, a delicate harmony of leaf and flower which is rare; while the wonderful great rosettes of *Meconopsis regia* glistening in winter would almost reconcile me to that season.

I start with Asia, China especially since so many of our best plants come from China. Both in art and in flowers we get our best things from China and I don't believe that they are exhausted yet; in the far regions of Yunnan and Kansu and on the marches of holy Thibet, there are still many valleys unexplored by botanists and plant lovers and I believe there are many good plants still to come to us. Practically every valley varies in its flora. We have only to read Farrer and Kingdon Ward to realize the wonderful plants which they found and have not yet succeeded

in introducing. There is still lots of scope for plant hunters of hardy plants and semi-hardy plants in these regions and there are not so many other regions left, a little of Africa on the Equatorial Mountains and perhaps on the high plateaux and mountain gorges of Basutoland, perhaps on the central mountains of Madagascar, something perhaps in the Andes, in Patagonia and in Mexico—all attractive propositions.

I

WATER PLANTS

"THAT GLORIOUS foliage which sways the Jewel of the world at its heart, when the huge leaves rock the dew-drop that they nurse—a shimmering globule of quicksilver in their glaucous cup; even if we are never to see the holy flower, the type of the human soul, from black mud aspiring high to daylight, and there unfolding a sweet and radiant rosy purity undefiled by all the darkness it has traversed."

So writes Reginald Farrer in the English Rock garden of *Nelumbo nucifera*, alias *Nelumbium speciosum*, the sacred bean of ancient Egypt, the lotus of India and China. Nelumbo has been heaped with honour in the discerning East, perhaps more than any other plant ever has been or ever will be.

I think there is no plant which appeals to me more and which I would rather grow successfully than Nelumbo. It is indeed a wonderful flower, full of all the mystery and charm of the East, yet also with a purity and delicacy that has never been found in East or West. It is a water lily, a member of the *Nymphaeaceae*, but its great leaves rise three feet high above the water, peltate and glaucous, so that each drop of water rolls itself up into a tiny round

ball and jumps and scurries about like a drop of quicksilver, a joyful and unceasing frolic. The leaves are very large, often a foot or more in diameter, floppy and loose at the edge, but towards the centre sloping down into a cup. The flowers are globe shaped when young but as they open and grow older, they become flattened like a shallow bowl. They are very large, often a foot or more in diameter. In the typical *Nelumbo nucifera* they are a clear pale pink colour, but there are other varieties, some with white flowers, others with crimson flowers, and an American species with yellow flowers. The seed heads are also most attractive. They look just like the roses of small watering cans brown and slightly turned forwards and downwards at the end of long stems. They are formed from an enormously swollen receptacle in the top of which the carpels are embedded. When ripe they are as large as small beans and rattle in their holes like a child's rattle. The seeds are eaten throughout the east as dessert and are said to have an agreeable flavour not unlike that of filberts. It was in this stage that I first saw this glorious plant in the warm aquarium house of the botanic gardens at Cambridge. Perhaps it is a plant which appeals particularly to the academic mind for I have seen it growing better at Cambridge than anywhere else, while I have been told that it also does very well at the Oxford Botanic Garden. Possibly the secret is that it is well established there and not disturbed or shifted too often.

At Cambridge it is grown in a tank, the top of which is almost level with the floor of the house, so that the leaves and flowers are carried up comfortably to the level of our eyes. Above the mud there is about two or three inches of water. The house, which also contains a large tank with tropical waterlilies and the largest scarlet Cannas which I have ever seen standing at its edge is kept pretty warm and I have been told that there is a hot pipe through the mud of the Nelumbo tank about two feet before the surface.

It is not, however, regarded as such a tender plant in all countries. Farrer says "Nelumbium, indeed, has no right to such affectations as this supposed dread of frost, as anyone will know who has seen it ramping by the railway ditches far up into the frozen north of Japan, while in Tokio itself of course the plant is solid ice for half the winter". Niklitschek records that the white form of *Nelumbo nucifera* has been grown for a long time at Zagreb in unheated tanks in the open and flowers there abundantly every year. For those weak in geography, Zagreb or Zagrab is synonymous with Agram, the capital of Croatia, part of Yugo-Slavia. There the plants are reported to have survived a temperature of -23 degrees C. which is a lower temperature than we experience in winter in this country.* But in central Europe they do get much

* "In the middle of August I have seen *Nelumbo* flowering magnificently in an outside tank in the Botanic Garden at Geneva."

warmer summers which enables the plants to make their growth and flower before winter sets in and to mature the tubers. Nelumbo is unfortunately rare in cultivation in England and I know of no plants outside warm glasshouses and even there it is not nearly as common as its beauty warrants. It is possible that the various forms might vary in hardiness and that good stout tubers obtained from the north of Japan where it is frozen every year might do better than tubers off plants which have been cultivated for many years in very warm houses. I feel that it should be possible to establish forms of Nelumbo in large tubs which could be placed outside during the summer in England and wintered inside away from the frost, being merely dried off. I have not, however, found the plant very easy to establish from the small tubers which are usually sent in spring from nurseries and several attempts have resulted in failure, the tuber rotting off before any growth began. It seems to me important to secure as stout tubers as possible. I imagine that it should not be very difficult to grow Nelumbo from seed but I have never tried. The seeds have extraordinarily long viability. It is reported that ancient Egyptians planted the seeds in balls of mud or clay, mixed with chaff and then sunk them in the water. Recently some seeds were found buried 2 feet deep in a peat bed in a valley in China. They must have been at least 120 years old and may well have been as much as 400 years old. The pericarp was re-

moved by soaking in sulphuric acid and after washing they were planted at Kew and germinated well in the *Victoria regia* house and flowered in August, 1932, from seed sown in April, 1931. With this Nelumbo probably holds the record for proven longevity in seeds since, as far as I know, none of the reports of seeds having been found in Egyptian coffins from the earlier dynasties and having recently germinated have been proved to scientific standards. Like other Nymphaeas Nelumbo is reputed to like a good rich compost.

Nelumbo nucifera is found widely distributed in the East, as far north as the shores of the Caspian and as far south as Australia. I have not seen the Caspian form in cultivation or in the wild, but in an old number of the *Botanical Magazine* there is a fine print of a very deep pink form of *Nelumbo nucifera*, which was said to have come from the Caspian. Its fine colour was alternatively attributed to the fact that the water in the basin had been frequently changed.

Although Nelumbo was frequent in ancient Egypt and features as the sacred bean in the literature and drawings, it is no longer found there. It is uncertain why it has died out. Some slight chemical change in the water of the Nile might be possible, but more likely is it that all the tubers were used as food and the plant has never been reintroduced. I read that it is common in Ceylon and throughout the East and India now.

There are many varieties and local types, but for the most part they are not seen in England. Niklitschek records that the Japanese alone are said to have raised about eighty different hybrids and forms. There is a fine white form and a double variety of it. Of the other forms probably the best are the "Grosherzog Ernst Ludwig" with salmon pink flowers up to 14 in. in diameter, *pulchra* with deep pink flowers and paler veins; this form is said to be very free flowering, as is also *pekinensis rubra* which has slightly smaller but darker carmine red flowers. There is a double pink form called *japonica rosea*, which is said to have double flowers like those of the *Paeony sinensis*, but this does not sound so attractive to me. There are also two dwarf varieties, *pygmaea alba* and *pygmaea rosea* with flowers and leaves considerably smaller than the type. In fact Niklitschek says that their leaves somewhat resemble those of a giant Tropaeolum—indeed a quick descent from the sublime to the ridiculous.

Nelumbo lutea comes from the rivers and estuaries of Carolina in North America and was introduced to England in 1810, just twenty-three years after the introduction of *Nelumbo nucifera*. In general form it resembles the Asiatic species, but the flowers are yellow in colour and the leaves a darker green and without the same fine waxy bloom to them. This species is said to be slightly hardier than the other, but it requires to be well established before flowering.

Nelumbo has often been identified with the lotus of ancient Egypt, and it is now generally known as the lotus flower and by that name I like to think of it; although it is more likely that the Egyptian lotus was the white water lily *Nymphaea Lotus* or even included all the water lilies of those parts, numerous forms of *Nymphaea stellata*, a beautiful blue species; while Nelumbo was the sacred bean. The lotus, eaten by Homer's lotus eaters, a Libyan tribe, was probably quite a different plant, *Zizyphus Lotus*, a prickly shrub which bears a sweet tasting sloe-like fruit and from which both bread and wine of a kind are made. Probably again the lotus of Ovid and Virgil was a different plant, our common birds foot trefoil, *Lotus corniculatus*.

But Nelumbo was definitely the sacred lotus of the Hindus and Buddhists, and wherever Buddhism has spread from its original home in India, it has carried a love of flowers and a particular veneration for certain plants, among which the lotus was the chief. Legend relates that the first action of Brahma was the creation of the lotus-flower. Another myth which occurs in the epic poems tells us that Brahma was himself born from a lotus, which grew out of the navel of the god Vishnu whilst floating on the primordial waters.

Nelumbo differs from the water lilies also in having hard warty prickles on the stem. Herodotus noticed this and claimed that the crocodiles avoided

the plants on this account, for fear of getting their eyes pierced.

The Cornucopia of Ceres in Greek and Roman drawings and vases may well have been derived from the seed-vessel of the Nelumbo in the hand of Isis, but the Greeks probably mistook it for a poppy capsule, with its swaying censer head and its generous shower of seed, and it is from the poppy that it is often thought to have been derived.

Nelumbo is the native name of the plant in the island of Ceylon. This has sometimes been Latinized into Nelumbium. Theophrastus described it in the group Cyanus, but by him this name was not given only to this plant but also to a leguminous plant, probably some kind of bean common in Greece, and was applied to the Nelumbo merely on account of the familiarity of the seed, "just as our English voyagers give the names of apples, pears and gooseberries to such tropical fruits as bear some resemblance to the produce of their own country, and precisely as Herodotus had long before, in describing the plant, called it a rose-coloured lily". The name lily has indeed been much abused in modern times also. It would be fun for botanists and horticulturists to try and list all the plants of different genera which are popularly called lilies, many even in quite reputable catalogues and publications. Some, like the Nelumbo, are not even monocotyledons.

The other giant among water-plants is *Victoria*

regia, and she is almost too staggering for anything less than a botanical garden, even when treated as an annual and raised from seed afresh every year. Under such conditions *Victoria regia* may be flowered quite well and will produce four or five of its magnificent trays, which will be enough to fill a tank twenty feet or more in diameter. The floating leaves are round and often as much as six feet in diameter, while the flowers are the largest of any aquatic plant. The edge of each leaf is turned up four inches or so at right angles to the water, and this appears like a real spinous rim to the leaf, since the under-surface of the leaf is interlaced with very prominent crimson veins, which are armed with formidable spines. Their buoyancy is considerable and often a child has been photographed sitting on one. The flower is fragrant and shaped like a great water lily. It is often as much as fifteen inches across. The colour is white and the centre pink. Like so many of the finest flowers, it lasts only for a day. Among such ephemeral flowers we can name some of our greatest beauties, flaunting and magnificent, since they have such a short time to enchant us and their insect pollinators. There are *Victoria regia*, the Mexican shell-flower *Tigridia ferraria*, and practically all of the cistus family, while the flowers of such beauties as the Californian poppy, *Romneya Coulteri*, and that beautiful single creamy Rose Mermaid, to me the most beautiful of all roses, are grievously short-lived.

Still, there is no doubt that the knowledge that a flower will be open only for a day does induce in real flower lovers an extra anticipation and eager tense watching of the bud, which is well repaid by such beauties, and as with most important experiences, the memory is often even more enjoyable than the reality.

All ages, except possibly our own, have clearly recognized that absolute perfection is unattainable in this world of time. Probably it does not exist and we cannot comprehend it even as an abstract concept, but we do feel that we attain nearest to it in sudden brief flashes of inspiration. The understanding and the approach to it can only be ephemeral and sudden; in the same way it seems to me that we may see a nearer approach to perfection in flowers which last only for a day, than in flowers which last for a week or a month and with whom the contrast of their sudden adventure and their absence is lost.

About the flowers of all water-lilies, there is a frenzy, a lavish generosity both of petals and stamens, which commends itself very much to me and provides an ample return for any hospitality which I may have bestowed on the plant. The Canna also has this quality of petaloid and frenzied generosity, allied generally to very hot but brilliant colouring.

Victoria regia was discovered in 1801, but was not really introduced till 1846, when one Thomas

Bridges, undoubtedly a worthy gentleman for this one act alone, successfully brought home seeds embedded in wet clay. *Victoria regia* is a native of the backwaters and side-streams of the Amazon and Orinoco. It is probably hardly necessary to point out that it was named in honour of Queen Victoria, being the most striking plant that was discovered and introduced during the nineteenth century, the plant with the largest leaves in the world.

In East Africa, among the little round volcanic hills of Kigesi, there is a lake called Bunyoni, the lake of the many little birds. In the evening there is a perpetual twittering, and up between the leaves of the water-lilies lying placid and silvery in the moonlight, there pop up many little dark heads. The many little birds are in reality frogs and the twittering is the croaking of innumerable amphibian throats.

Against the dark water, the leaves of the water-lilies make a beautiful pattern, gleaming and romantic in the warm tropical night. Water-lilies should always be so; their leaves should never be so restricted that they push one against the other until they are forced above the water, vertical instead of horizontal, plates on end instead of flat on the table. Yet often in gardens we see them so.

In the morning we paddle slowly in a little canoe among the water-lilies. The flowers are all open in the sunlight, a beautiful deep sky-blue, several whirls of petals surrounding the generous mass of

true golden stamens in the centre. These are the largest and finest of all the blue water-lilies, I have seen in Africa. They are the richly-scented *Nymphaea capensis*, and there is a wide fringe of them all round the edge of the lake. On Lake Kioga also we would drift for miles in a canoe among the water-lilies, the paler blue *N. stellata*, grading into deeper blue and even pink forms and the dignified creamy-white *N. lotus*, standing well above the water, surrounded by great fringed leaves, shadowed dark into the depth of the lake.

The African boys chant and slap their paddles against the side of the canoe; then suddenly they glide quietly forward to approach some exotic bird, a whale-headed stork or a goliath heron.

These were moments of great delight, and since then I have always wanted to grow tropical water-lilies. Unfortunately that is impossible without a large heated tank, as the plants cannot well be constricted into tubs. Still, it is probably better to have the memory of their African glory than a restricted plant miserable under dull English skies and inadequate heating. In plants grown in England I have never found the fine colour of those we saw in Africa.

There are also very many beautiful water-lilies which are quite hardy and easy to grow in English ponds. They will even flourish in artificial concrete tanks, provided that there are also oxygenating plants and snails to keep the water clear and fish to

eat the mosquito larvae. Goldfish can be useful as well as decorative; in a small pond they will breed each year if you buy also one male fish. They are four times as expensive as the female goldfish. Little goldfish are not red, but brown, and only colour after they are a year old. Their parents are carnivorous and eat a number of their young, but a few survive with us each year. They have enemies also in the form of the larvae of dragonflies, fierce beasts with very carnivorous habits and a superficial air of devoutness, like the praying mantis.

The finest white water-lily is probably *Nymphaea Gladstoniana*, which has flowers full six inches across, standing sometimes as many inches above the water level, but it is a plant of excessive vigour and should only be planted in really large ponds, if it is not to become constricted before a year is out. Niklitschek of Vienna writes of a new white hybrid called *Poestlingberg* which begins its growth earlier than most other varieties and has larger white flowers than any other, flowers often ten inches in diameter. I have, however, no experience of this plant. The ordinary wild *Nymphaea alba* is a plant of great beauty and more suitable for small ponds. There is just a touch of creaminess in the flowers which tones in well with their golden mass of stamens in the centre. There are now many fine hybrids with pink and yellow flowers, and a few of these almost approach that really deep crimson without any touch of blue in it that water-lily

specialists always have desired. Probably the best crimson is *Escarboucle*, whose flowers are large and only rise a little above the water. It is not a fiery crimson, but a rich deep purplish crimson. Other good crimsons are James Brydone, which has more globe shaped flowers, and William Falconer.

With James Brydone and *N. alba* in a small concrete tank, we grow *N. marliacea chromatella*, which has very large pale yellow flowers of a good starlike shape and standing up well above the water. The leaves of this plant are also attractive, being marbled with deep crimson. In fact, when young they are almost entirely crimson.

The pigmy water-lilies from Japan are also popular now, and have all the merits of the big varieties in form and colour. Yet they lack their abundant generosity and bounty. They are almost austere, and that no water-lily should be.

The water-hyacinth *Eichornia crassipes* is also an interesting plant. It has large swollen air bladders with which it floats on the water. They are like little green balloons at the base of the leaves, growing like the pseudo bulbs at the base of the orchid leaves. The flowers are pale mauve and rise on stout stems well above the green balloons. The roots hang down into the water like those of Azolla, and the whole plant can sail sedately like a Spanish galleon, or a Portuguese man-of-war. Unfortunately, *Eichornia* is not completely hardy, but it can easily be taken into the house for the winter and

floated on a bowl of water in a sunny window. A few pebbles and a little oxygenating plant, such as *Myriophyllum* or *Elodea* should also be put into the bowl. Such conditions will also suit that delightful rush from Madagascar, *Cyperus alternifolius*, a plant which always reminds me of a Chinese painting, so simple and so beautiful is its foliage, ray-shaped whirls of narrow leaves towards the top of short rush stems, like the little windmills on sticks that are made for children.

Even in the most austere of formal surroundings, I do not think that the edge of a pond should be completely bare, straight concrete or stone. There should be some plants near the edge, and these may be planted in rectangular blocks at the corners in soil held up by a concrete wall, but into which the water penetrates freely, or they may be planted in beds all along the sides. I think that in nearly all ponds it is good to be able to approach the water directly in a few places. It should not be entirely screened off by water-side plants, but the effect of these places of approach will be heightened by clumps of rushes, such as *Cyperus paramattensis* or the bullrush Typha or Japanese Kaempferi Irises. There are some wonderful forms of these now developed, and I hear from Japan of some with flowers over a foot across, but I have not yet seen any such.

The surface of the water should never be completely covered with the leaves of the water-lilies. At intervals they must be thinned out, so that there

are open patches of water on which the leaves may lie in a decorative pattern and in which the sky and surrounding plants may be reflected. A tall Italian cypress at the side will often provide a spire going up to the sky on one side and down into the water on the other—a living, vibrating column of dark mysterious greens.

II

MAGNOLIAS AND CAMELLIAS

MAGNOLIAS confer distinction on any garden, however small it may be. Called by some botanists primitive, they have a dignity which is rare in plants. They are the true artistocrats of the garden. I think the finest of all is *Magnolia Campbelli*. Unfortunately it is still rare in English gardens, although there are now some fine specimens in the South and West Country, and in Ireland. It does not flower till it attains a certain age and maturity. Lord Aberconway, in the report of his lecture on Magnolias and Camellias at the Royal Horticultural Society Shrub Conference, reports that he planted one in 1904 and it flowered for the first time in 1921. Still I think it is worth waiting for. It is no good putting off the planting, either. Better do it while you are still young. I planted one last year in a warm corner between the greenhouse and the south wall. Still I am yet young.

Magnolia Campbelli is a forest tree of the Himalayas, growing between eight and ten thousand feet in Sikkim and Bhotan. It was discovered by Dr. Griffith, of Bhotan, and named after Dr. Campbell, who was Resident at Darjeeling, a wonderful ever-

living memorial, since it is one of the chief glories of the forests around Darjeeling—forests which I believe are now sparser than in Hooker's day. The fine plate is taken from Hooker and Cathcart's *Illustrations of Himalayan Plants.* In Sikkim it often grows eighty feet in height and twelve to thirty feet in girth. The bark is dark, almost black; in April all the ends of the branches are covered with flowers, wonderful pink chalices opening gradually into flat plates. The colour is generally deep rose-pink on the outside and inside white, faintly tinged with pink. The flowers are six to ten inches in diameter and have a faint scent. The shape of the unopened flower is almost perfect, as near perfect as any flower can be, and still exist in this world, where absolute perfection is mercifully unattainable and also inconceivable to the human mind.

Sir Joseph Hooker, writing in the *Botanical Magazine* last century, describes it as "the noblest specimen of the genus; before the destruction of the grand forests that clothed the higher elevations of the outer ranges of the Sikkim Himalayas, it was by far the most notable tree of the district and I have seen the flanks of a mountain rose-coloured in spring from its abundance, and its habit of flowering before the development of the leaves."

Consider the glory of a tree which could make the mountain-side rose-coloured in spring, the green forest slopes leading up to the eternal snows

MAGNOLIA CAMPBELLI

of Kanchenjunga and Everest and the other Himalayan peaks.

In England *Magnolia Campbelli* flowers at the end of February and in early March. Consequently the blossoms are often injured by spring frosts. There are, however, glorious—albeit dangerous—springs such as that of 1938, when February and March bring beautiful warm sunshine, and in those years such a plant as this may pay back the disappointments of other springs. This magnolia has a reputation for tenderness, but Lord Aberconway remarks that it does well from Sussex to Cornwall and up the West coast. In the South-Eastern counties around London I think that it should do well enough in warm corners against walls. I have seen it in the open, away from any wall, twenty feet high, in the late Mr. Hanbury's garden at East Grinstead, but I was told it had not yet flowered. Apart from cut branches exhibited at early spring shows of the Royal Horticultural Society, I first saw this magnificent plant in flower in the temperate house at Kew—two enormous pink buds thirty feet up by the glass. There are very few gardens, however, which have a temperate house high and mighty like the one at Kew. I always think it the most beautiful and most interesting house there, with its wonderful tree-ferns and yellow Forsythias and cherries in the early spring, and the magnificent specimen of the weeping *Cupressus kashmeriana*, grey and pendulous, reaching to the roof.

Magnolia Campbelli is a rapid rather straggly grower. Against a blue sky the great flowers look almost like lotuses. The leaves also are large and decorative, slightly glaucous and pubescent beneath when young; glabrous when older. At Kilmacurragh, near Dublin, there is a specimen which in 1921 was reported to have borne a thousand flowers.

At the Chinese end of the Himalayas and in Yunnan there grows *Magnolia mollicomata* which would seem to be closely allied to *Magnolia Campbelli*. In fact it is doubtful now whether it should still be accorded separate specific rank, or be considered as a variety of *Magnolia Campbelli*. The flowers are not so globular as those of *M. Campbelli*, and the pink colour is chiefly found at the base of the petals. It is still very rare in cultivation in England and I have not seen it in flower, but Lord Aberconway in the report of the Royal Horticultural Society shrub conference writes that it has flowered at Bodnant in twelve years from seed, and that it blooms slightly later than *M. Campbelli*. In this its chances of success in this country are relatively greater, and it sounds as if it might be an even more desirable plant than the *M. Campbelli*. The rhapsodies under which Farrer describes *Magnolia rostrata* apparently should be now attributed to *Magnolia mollicomata*, for the original description of *Magnolia rostrata* was a mixed one, the flowers being those of *Magnolia mollicomata*, the leaves and fruit those of *Magnolia rostrata*, which is also very little

known in cultivation and is accounted a very exciting plant by the collectors Farrer and Forrest, who have seen it *in situ*, its flowers varying from pink to pure white. Lord Aberconway in his paper before the Royal Horticultural Society shrub conference, however, pours cold water on the true species, describing it as "somewhat tender, difficult to grow and not as good an investment as *M. obovata*." It flowered for the first time in this country in 1938.

Both these magnolias have been found in Yunnan in mixed and in pine forests, and also in open glades between seven and ten thousand feet, and also on the Mekong Salween divide of Upper Burma, where the monsoon rainfall is very high. Consequently they are likely to do best in the West of England and in Ireland, where the rainfall and atmospheric moisture are higher than in the East of England. Only in some seasons, especially in the West, there is not enough sun to ripen the young shoots sufficiently for flowering the next year. In magnolias adequate ripening of the wood is probably as important as adequate moisture. Forrest, the great plant-collector, writing in Mr. J. G. Millais's book about *M. rostrata* (probably should be *M. mollicomata*) records: "I shall always remember my first sight of a group of those magnificent magnolias in full flower! I got within a mile or so of them, from which distance the masses of pink blooms showed up distinctly but, surrounded as the trees were by heavy snow-drifts ten to twelve feet in depth,

fully a week passed before I could secure specimens."

There is yet another magnolia of this group with pink flowers—*Magnolia Sargentiana*—and it is now finding its way into cultivation and lists, although it is still rare. Some say that it is the finest of all the group, and in China it is certainly a giant, even if it is not so strong a grower here as *M. Campbelli*. It flowered for the first time in this country in 1931 at Caerhays Castle, and in 1932 at Nymans garden. Mr. Comber reports that the flower buds at Nymans appeared in the autumn. The outside of the flower was a rich purple-pink and when opened it measured about eight inches across, showing a delicate mauve pink interior, which gradually faded to mauve tinged white. The flowers lasted for about ten days. Mr. Bean reports that it is perfectly hardy at Kew, and says that it is at least as beautiful as *M. Campbelli*, besides being hardier and flowering later. The flowers open in April or early May on the naked shoots. There are twelve to sixteen sepals and petals so that the flowers are rather fuller than in other members of this group. It was first discovered by the Abbé David in 1869, and later described as *M. conspicua var. emerginata*. We owe much to the efforts of plant-collecting missionaries in Western China, particularly Delavaye and David. It was to Wilson, however, that we owe its introduction to gardens. Wilson recorded that in West Szechuan specimens were common up to

sixty feet in height in thickets and moist woodlands between 5,000 and 6,500 feet. He found one tree eighty feet high and five years later made a special trip to photograph it in flower, but it had been cut down. *M. Sargentiana* is the largest Chinese magnolia. Mr. Bean records that Wilson introduced many magnolias although he was not their first discoverer. His magnolia introductions include *M. Dawsoniana*, *M. Delavayi*, *M. Sargentiana*, *M. sinensis*, *M. Sprengeri* and *M. Wilsonii*.

There is also a fine hybrid *Magnolia Veitchii* in cultivation. It was first raised by Mr. Peter Veitch, of Veitch's Nurseries at Exeter by pollinating a forced plant of the white Yulan with *M. Campbelli* in 1907. The hybrid is still a rare plant, although it is recorded to have great constitutional vigour. Mr. Veitch raised five seedlings from the cross. Several of these were white in flower, but among them was also a fine pink form, almost as good in colour as *M. Campbelli* and flowering much younger.

Even if *Magnolia Campbelli* is still comparatively rare, the Yulan *M. denudata* is fairly common now. Nor is patience required, for in most cases the plants sent out by good nurseries will flower the first year. This magnolia is rapidly finding her regal way into every garden, and our descendants will have every cause to bless us for it. I have seldom been more stirred by a plant than by a sight one evening in Mr. Slocock's Goldsworth's Nursery at Woking of a magnificent specimen, full forty feet

high and forty feet across covered with white goblet flowers, cool, silent, still and flood-lit. The dark sky and group of dark conifers formed a perfect background. It was a rare magical effect, seemingly far removed from the everyday business world of London which I had just left, more in tune with the slow monastic life of Western China, where the Yulan has long been held sacred and cultivated. Each flower is so thrilling, so devastating in its excellence. It thumps home its beauty as the resounding bell from Moussorgsky's Khowantchina thumps home with Oriental determination the peace and solemn progress from day to day and year to year, the unchangeability of life in a Chinese monastery.

There are many varieties and hybrids of the Yulan in cultivation. Probably the finest is the variety named *alba superba*, pure white, vigorous and very free flowering. *Magnolia liliiflora* has been freely crossed with the Yulan and to this cross we owe all those fine varieties which are dark vinous-purple on the outside of the petals and pale inside. The best are *Lennei*, with rather round goblet-shaped flowers, and *rustica rubra* with very dark slightly more slender flowers. The popular *Soulangeana* is also a product of this cross, and it is probably the most vigorous magnolia in cultivation of those which flower in spring, before the leaves are fully out. However, its flowers—white, stained with purple—seem to me neither geese nor fowl, neither the true pure

white of the Yulan nor the rich vinous-purple-red of *rustica rubra*, of which the best varieties have almost the glow of old port.

Mr. Dykes used to say that it was possible to have irises in flower every month in the year. This is not possible with magnolias in most countries, but it is possible to have them from February to November. In February comes the earliest, *Magnolia Campbelli*. In March this is followed by *Magnolia stellata* and towards the end of the month in a favourable year, *Magnolia denudata*. In April and early May the hybrids "process" one after the other—*Soulangeana*, *Lennei*, *rustica rubra*, *Brozzoni*. In May *M. parviflora* and *M. Wilsonii* should begin to flower, and *M. parviflora* may continue till the middle of July. It will probably never be covered with flowers, as is the Yulan or *M. stellata*, but over a period of two to three months a good specimen is likely always to have a few flowers out. These are especially charming when looked at from below, since the flowers are slightly pendulous and from above the ring of crimson stamens, contrasting with the dead white petals is not apparent. This applies also to *M. Wilsonii*, which also has a faint, though charming scent. In the middle of July *Magnolia grandiflora* should be in flower and, in a favourable season, may continue right up to the middle of November. In July also flowers the glorious *Magnolia Delavayi*, evanescent and still rare in flower, although in foliage probably the finest of the evergreen magno-

lias, rivalling even the giant-leaved rhododendrons *sino-grande* and *Falconeri*. *Magnolia macrophylla* flowers about the same time. I have only once seen this plant, which is still very rare in cultivation in England, but from cut sprays it is most exciting—flowers ten inches across, often described as nearer fifteen, and leaves, the largest of any magnolia, from fifteen to thirty-six inches long, and deciduous. Mr. J. G. Millais in his book on magnolias records Wilson as saying up to three and a half feet. Even so the flowers look small in relation to the vast leaves. They are white, but not the brilliant white of the *Yulan*. It is an American species from the sheltered valleys and forest glades of North Carolina.

There are also magnolias which come from Guatemala, Porto Rico and even Java, exciting-sounding plants, which I have never seen growing in England and which would not be hardy in England, while few certainly have greenhouses large enough. Besides, the species we already have growing outside are so wonderful, only a miser, or a gardener would ask for more. Mr. Dandy at the Royal Horticultural Society shrub conference, said that out of thirty-two "possible species", we already have twenty-seven in cultivation and these are probably the best. This of course does not include hybrids or varieties. Of the "possible absentees" Mr. Dandy mentions *M. dealbata* from the mountains of Mexico and *M. Ashei* from Florida, both of which

are evergreen and would be likely to be tender. The remaining three species come from China and sound well-worthy of introduction, particularly *M. amoena* which is described as allied to *M. denudata*, but with smaller flowers, which are pink instead of white.

Practically all magnolias appreciate a soil with abundant humus and even peat, but in spite of this many of them will grow on chalk. *M. kobus* and *Lennei* succeed well. Although it is possible to move magnolias up to very large sizes, I have found that this nearly always imposes a check on them, and even small plants in this rather light soil seem to require a year or two to settle down before making much growth after moving. So it is well to choose their final place when they are bought and settle them in there when small. Magnolias can be layered, grafted, and raised from seed or cuttings. The seed is often of very poor viability, especially if it has been dried, and may be very slow in germinating.

Many of us associate camellias with magnolias, and they are the next group with which I would like to deal, being also a product of the Himalayan slopes and the Far East, long cultivated in Chinese and Japanese gardens. I think that the queen of them all is *Camellia reticulata*, introduced to this country from the gardens of China in 1820 and flowering in Kent in 1826. The cultivated plants in China were all the semi-double and double varieties, and it is the semi-double form which is regarded by

the horticultural trade as *Camellia reticulata*. It is an unusually beautiful plant, evergreen, with large dark leaves, dull on the upper surface, and with the venation clearly visible. In this respect it differs from *Camellia japonica* which has smaller leaves, shining above and with the venation hardly visible. All camellias are rather slow growers, but in a favourable situation *Camellia reticulata* will grow into a small tree ten or fifteen feet high. The flowers are deep crimson-pink, glistening, rich and luscious, florally juicy as is a ripe peach. It is not a tight, compact flower, as are many of the double forms of *Camellia japonica*; it is a loose, slightly floppy flower, yet in the semi-double form it does not seem untidy. I have seen reports that the flowers are sometimes as much as nine inches across. This size is rare, but six inches is quite common.

Only in 1912 did George Forrest, one of the greatest of our plant collectors, find the single wild form of *Camellia reticulata*, although the semi-double form had been known for a hundred years. He found it growing in scrub, thickets and open pine forest, between six and eight thousand feet around Tengyueh in Western Yunnan. In 1932 it flowered at Caerhays in Cornwall, Mr. J. C. Williams's famous garden, and a plate was prepared of it for the *Botanical Magazine*. The semi-double form can be grown quite successfully out of doors in the South-Western and similarly mild counties. Probably around London it can be grown out of

doors in suitable positions against a wall. It is more often placed against a north or east wall than against a south wall, so that the flower-buds are not encouraged to open too early in the year. In this position they do not receive early morning sun after a frost, but have time to thaw gradually. Lord Aberconway in the report of the Royal Horticultural Society shrub conference, however, says that on a south wall "it grows much more closely and flowers to profusion".

Camellias are much hardier than their reputation. Our ancestors, for the most part, grew them in pots and tubs for the decoration of the cool greenhouse, and much labour they must have devoted to it, not to mention coke in winter. However, the magnificent trees of *Camellia japonica* in the woodland garden at Wisley are surely a demonstration that it is a hardy plant, and most other camellias are the same.

Camellia reticulata is probably the most tender, and in Midland and Eastern counties best repays growing in a cool greenhouse.

The plants of *Camellia japonica* in the wood at Wisley must be between twenty and thirty feet high, and they are covered with flowers each spring, one crimson and one white. Some of the flowers may be destroyed by frost, but more nearly always come. They are a magnificent sight. All camellias are rather slow-growing, especially when young. They like a position with a rather moist, acid peaty soil, not water-logged, but with some underground

moisture. They are generally grown in semi-shade if in the open, or against north or east walls. They should be protected as far as possible against wind. The varieties of *Camellia japonica* are innumerable. The colour of the flower also varies with soil and position, and can even be varied from year to year as the acidity is varied. Deeper tints are produced in soils as acid as pH. 4.0 or lower. This is the optimum with plenty of sunshine. Lighter tints and less vigorous growth are produced by neutral or slightly alkaline soils. My chief authority for this is a famous American grower, and my own experience agrees although it is much less. As one friend described to me, probably no two individuals are alike. I prefer the single and semi-double varieties to the completely double ones. I think that the finest crimson-pink varieties are Lady Clare, and Adolphe Audusson. These almost equal *Camellia reticulata* in size and charm. Of the lighter coloured forms, I recommend *C. magnoliaeflora*. The flowers are not so large as in the other species mentioned, but they are very perfectly formed, white just tinted with a faint warmth of pink. Peach Blossom is one of the best varieties and is a slight but definite improvement on the type. The Japanese list many varieties under special names and with exciting colours, but I have not sufficient experience to comment on them. *Arajishi* is "intense fiery-scarlet"; *magnoliaeflora nigra* is "double black crimson", and also sounds exciting. The

ordinary tea-plant, formerly called *Camellia sinensis*, now *Thea sinensis*, has smaller flowers and is not very hardy in England. We had much better get tea from China or Himalayan slopes.

III

INSECTIVOROUS PLANTS

ALLIED in my mind with the fly-pollinated plants are the insectivorous or, as they are commonly called, carnivorous plants, Nepenthes, Sarracenia, Darlingtonia, Drosera, Dionaea and Pinguicula. Many of them are streaked with dull crimson or brilliant scarlet and have superbly cunning mechanisms for holding their prey once it has been attracted into the pitcher or on to the sensitive leaf.

The centre of the present distribution of the Nepenthes is in Borneo. On an expedition to Sarawak I was enabled to examine a number of species in their native habitats.

In the staggering richness of the tropical jungle and the weird, fantastic fairyland of the moss forest, these pitcher plants stood out as the high-lights of excitement for me, even beyond the many beautiful orchids we found. In four months we found over thirty-three new species of orchids alone.

Here were forests, so luxuriant that they seemed a frenzy of greens, a solid wall, a never-ending sky-scraper of leaves overhanging the water's edge; behind was darkness and mystery and more and

more plants, many still unknown and all thrilling to the young botanist.

Then, four thousand feet above the river up which we had come in Bornean canoe, paddled in quick rhythm with wild song and pulsating chant, we came suddenly into the moss forest, where striped and gaudy pitchers hung on twisted stem and white and yellow orchids scented the air, all backed by this feather bed of moss; everywhere, on the ground, on the tree trunks, on the branches —caves of green moss, covering tussocks and boughs, often twisted and contorted into weird shapes and bearing the semblance of strange faces.

I never felt alone in the forests. As we moved slowly up river, these forests were like a dream come true to me—a dream of abundance, of beauty and peace, but also of mystery alive behind the wall. All abstract words for concrete objects—yet the power of the forest forces is so great that we cannot be impartial to it. Man cannot fail to be dominated by the forests.

Nestling against the tussocks of moss were the pitchers of the Nepenthes—Nepenthe, the old goddess of sleep and oblivion—and certainly it is oblivion for the many insects which find their way into the pitchers and are drowned there and slowly digested. The pitchers are beautiful; they are streaked and painted with a theatrical brilliance, their form designed by a Cellini endowed with a Machiavellian and wholly diabolical cunning.

One of the best accounts of the Nepenthes is in the *Horticultural Journal* of 1897. It is by Veitch, head of the old Chelsea nursery of exotic plants. He records that the name Nepenthes was taken by Linnæus from the *Odyssey*, Book IV, line 221: "She (Helen) threw a drug into the wine, from which they drank that which *frees men from grief*, and from anger and causes an oblivion of all ills—"—an excellent drug if only the men weren't turned into swine while comatose. Linnæus writes: "If this is not Helen's Nepenthes, it certainly will be for all botanists. What botanist would not be filled with admiration if, after a long journey, he should find this wonderful plant? In his astonishment past ills would be forgotten when beholding this admirable work of the Creator."

The Nepenthes are dicœcious under-shrubs or lianas. Some grow thirty or forty feet high. The inflorescence is a raceme or a panicle, and the flowers are small and relatively inconspicuous. The pitchers are as conspicuous as possible. They are borne at the ends of the leaves, dangling on a curved stem which often performs the functions of a tendril. This is a prolongation of the mid-rib of the leaf. The tendril joins the pitcher at its base and at the top of the pitcher is a lid. Contrary to popular supposition, this lid does not move, but any insect which attempted to fly out of the pitcher would be likely to collide with it.

The first pitcher we found in the moss forest was

Nepenthes tentaculata. It was one of the smallest but one of the most beautiful. It is hard to describe the form of the pitchers. They are like some very elaborate and exotic pipe, coloured on the outside green and streaked with crimson. They are variable in colour. Often they have a bluish-purple tinge. The inside of the pitcher is pale blue. Often six inches in length and two inches in diameter, they hold a considerable amount of liquid. The angles and the lid are feathered with deep crimson hues. Always these plants grew in shade and seemed to like a lower light intensity than the other species we found, which clambered up to the light.

In Borneo there is no doubt about their insectivorous habits, but it is doubtful whether the insect food is necessary to them. In English greenhouses they seem to grow quite well without any insect food. Perhaps we may regard the decayed insect food as a savoury titbit, supplying extra nitrates and other salts, to use an anthropomorphic simile. In nearly all species the rim of the pitcher is smooth and extremely slippery so that any insect, attracted by the bright colour or by the nectar secreted by the glands around the rim, would be inclined to fall down into the fluid below. Some of the larger pitchers contain more than a pint of fluid. One-way traffic only is ensured as the rim of the pitcher is generally formed after the manner of one of those unspillable ink-pots and has stiff hairs projecting downwards from the edge.

NEPENTHES HOOKERIANA

The inside of the pitcher is covered with small glands which secrete a fluid, allied to the proteolytic enzymes of our own insides and possessing digestive properties. The fluid inside the pitcher is distinctly acid, and it is probable that the digestive functions of the enzyme can only work in an acid medium. Even a young, unopened pitcher contains some acid fluid. In a large pitcher the greater part of the fluid is probably due to water which has condensed inside the pitcher or entered as rain. Inside the pitcher are remains of many kinds of small insects in varying stages of decomposition, mostly small flies, beetles and moths. Occasionally, parts of large insects are found inside the pitchers. But, an amazing fact, the pitchers also contain a considerable fauna of living aquatic insect larvæ, particularly mosquito larvæ. It seems probable that the digestive enzyme can only act on dead matter, and even then its digestive powers are weak, as it is considerably diluted with rain-water. It has also been suggested, and there is some experimental evidence to support the suggestion, that these mosquito and fly larvæ contain an antiprotease substance which would inhibit their digestion by the proteolytic enzyme of the pitchers.

Burbidge, an early Bornean traveller and one of the most celebrated collectors of pitcher plants, reports an interesting confirmation of their digestive powers. Many of the people of North Borneo drink the fluid secreted into the young pitchers,

and regard it as a certain cure for indigestion. There are also aerobic and putrefactive bacteria found in the pitchers, while the formic acid liberated from the ants caught by the pitchers, must help the process of digestion, which always proceeds best in an acid medium. There are glands of various kinds on nearly all parts of the Nepenthes plants, on the stems, on the leaves, on the tendrils, on all parts of the pitcher and even sometimes on the flowers. The majority of these glands exude a sweet juice and are purely "attractive". The digestive glands are only found on the inside of the pitcher. In some species they are very numerous indeed. In structure many of them are very similar to simple animal glands.

As we cut our way through the moss forest we found other remarkable species of pitcher plants, *Nepenthes Rheinwardtiana*, *Nepenthes Veitchii* and *Nepenthes stenophylla*. I think that *N. Rheinwardtiana* was the most graceful and beautiful of all that we met. The slender stems scramble up through the moss and small trees to reach the light. Often they are thirty feet long, and at the top only are found the large crimson pitchers dangling free in the air, ten or twelve to a plant. As the leaves die off, so do the pitchers, and more grow above on the young leaves. In shape they resemble narrow flasks and are often as much as fourteen inches in length. They are not streaked and blotchy as other species, but a uniform rich deep crimson in colour. Inside the

pitcher is a pale green in colour, while just below the cup are two brilliant emerald spots which gleam as eyes.

The pitchers of *Nepenthes Veitchii* are large and resemble both in shape and colour the popular hybrid often seen in cultivation, and named after Sir W. Thistleton Dyer. It is a magnificent plant, a flamboyant beauty. The pitchers are covered thickly with a down of pale pink hairs, while the lip of the mouth is prolonged upwards into a fan-like structure of extreme slipperiness coloured with brilliant diagonal stripes of green and scarlet. They are often ten inches to a foot in height and four to five inches in breadth. Down the front from the mouth to the base are two fringed wings of pink or crimson hairs. The pitchers are borne on rigid stems which adpress them closely to the tree trunk. The stiff leaves also clasp closely round the trunk, as a man might clasp it with his arms. This distichous habit is probably unique in the genus and the plant is almost a true epiphyte. *Nepenthes Veitchii* is limited to the mountains of North-west Borneo. In addition to Mount Dulit, it is found on mountains around Kuching. It has been suggested that it is a mountain form of *Nepenthes maxima*.

This plant might be grown to advantage up a pillar of fibre and moss kept in place with wire-netting and supported round a central wooden core, such a pillar as I have seen used for Aroids in the Cambridge Botanic Garden. In order that the whole

pillar may be covered with pitchers, the plants should be placed in the fibre at intervals of about two feet up the pillar. The natural legginess of the plants will then be covered.

Nepenthes Veitchii has also been found on Mount Kinabalu, and there is a plate in the *Botanical Magazine* under the name of *N. villosa* prepared from material from that mountain, the home of the finest pitchers, also according to the local people, of many dragons and spirits. It was found at eight thousand feet on Mount Kinabalu, twice the height of Mount Dulit, where we went; the pitchers were more than a foot long.

The king of all the pitchers also grows on Mount Kinabalu. It is *Nepenthes Rajah*. It was first discovered by Sir Hugh Low in 1851, together with *N. Edwardsiana*, *N. Lowii* and *N. Veitchii* (then called *N. villosa*). It was introduced first to this country by F. W. Burbidge, one of the collectors sent out by Veitch's wonderful Chelsea nursery. That firm must have been responsible for more fine introductions to this country than any other organization or individual. Their work is fittingly commemorated in that magnificent publication, the *Hortus Veitchii*. Gardeners of to-day should both be sad and ashamed that so many of the fine things introduced by them are no longer in cultivation and need re-discovery to-day.

Burbidge records his discovery of *N. Rajah* in his fascinating book, *Gardens of the Sun*. He found it

among long grass and small shrubs at nine thousand feet on Mount Kinabalu, and also as low as four thousand feet, a considerable range. It has never been recorded from any other mountain. It forms a small shrub about four feet high; the leaves are thick and leathery, and the younger parts are thickly covered with a rusty-coloured pubescence. Burbidge records that they grew not in the forest but in open places where the soil was a stiff yellow loam, surfaced with sandstone grit. There is a fine picture and an account in the *Botanical Magazine*.

The account in Professor Danser's "Nepenthaceæ of the Netherlands Indies" in the Journal of the Buitenzorg Botanic Garden, states the pitchers are twenty to thirty cms. high. His work is probably the leading authority on the genus.

The pitchers are rather squat and fat, comic like an old Dutch burgher with a ruff, half as broad as they are long, as far as I can gather from descriptions, a fuscous maroon brown in colour. The interior is wholly glandular, the collar or periosteum is very broad and transversely plaited, the outer margin is lobed and waved like an exotic tropical sea-shell, while the inner margin is toothed. Between the downward pointing teeth are pores leading to nectar glands. In colour the pitcher is described as "atrosanguineum", a deep blood-red, probably grading to maroon. There is a green fringe down the belly. The lid is green, prominently veined with pink. At the base of the lid is a series of

teeth overhanging the cavity and seemingly forming a prolongation of the central pink mid-rib of the lid.

As far as I know, there only remains now one plant of *Nepenthes Rajah* in the British Isles, and that is at Glasnevin Botanic Gardens by Dublin. I have seen it there, but it did not then have any vast pitchers. The species is reputed to be difficult to grow. Since it comes from a high altitude on Kinabalu, it is probable that it does not require the stove-house conditions which are usually accorded to Nepenthes in this country, but would rather prefer the temperature of a shaded intermediate house. In 1905 Sir F. W. Moore wrote in the *Botanical Magazine* that he had left at Glasnevin the last plant that survived from the original importation of Burbidge. He had been advised to treat them hot and moist, but found that was not satisfactory. He transferred his last plant to a cool orchid house and immediately it began to grow. Sir F. W. Moore reports that he tried to propagate it by rooting the head, but failed in consequence of trying to force it. He writes in the *Botanical Magazine*: "The secret of growing it seems to me to be moisture, shade and intermediate temperature. The leaves quickly get discoloured and sick when exposed to the sun."

From my own experience in Sarawak, I noticed that all the Nepenthes were closely restricted to very definite habitats and that individual species did not vary much either in range of altitude or in environment. There was an approximate mean differ-

ence of 10° F. between the temperature of the moss forest and that of the white sand forests of Marudi and Miri, and we found no species common to both. We found no species at all in the great primary rain forest growing on the heavy clay soil of the upper Baram River or in the secondary forest on the same soil along its banks and around its long houses. In the moss forest, even the distribution of the pitcher plants was not uniform, and micro-ecological climates and habitats contained different species of Nepenthes. From this it seems to me that their cultivation in England should not be uniform but that they could be divided into stove-house plants—i.e., those from the sand forest at sea-level —and intermediate-warm greenhouse plants—i.e., those from the moss forest regions. A very high degree of humidity would be necessary in both houses, although in our observations on the moss forest we found that the humidity sometimes fell as low as forty per cent.

Burbidge once suggested that the mountain Nepenthes from Kinabalu might be grown in a cool greenhouse surrounded on all sides by hot stove-houses from which warm moisture-laden air might penetrate. They are natural inhabitants of the great mist zone where the cool air from the mountain top meets the warm currents of air rising from below. Very similar zones are found about ten thousand feet on the Equatorial mountains of Africa, and there again moss forest is formed and the plants are

difficult of cultivation in England. I believe that there are similar zones in parts of the Himalayas, particularly in North Burma, but sadly few of the many exciting plants collected there by Farrer have survived in English gardens.

Many of the other pitchers of Mount Kinabalu are very fine also. There is *Nepenthes Lowii*, which is waisted like a Victorian lady, pea-green outside and mahogany red inside. *Nepenthes Edwardsiana* is a twining plant. The pitchers are brick-red, tall, straight and slender, with a ferocious row of teeth round the mouth.

In the marshy parts of the white sand forest close to Marudi and in the open scrub with a white sand soil behind Miri, we also found many pitcher plants of which the most interesting were *Nepenthes bicalcarata* and *Nepenthes ampullaria*. *N. bicalcarata* was perhaps the largest of all the pitchers we met; in size it is only rivalled by *N. Rajah* and *N. Lowii*. The pitchers were nearly globular and often as much as six inches in diameter across the mouth. They varied in colour from a pale green to a deep crimson. This is a vigorous species and often stems were found fifteen feet in length. The most exciting part of the pitcher is two stout spines which project downwards from the lid. There is a story that one eminent botanist, desirous of hoodwinking the public, affixed a dead rat to these spines and proclaimed the plant as a mammal catcher. This is, however, a possibility in fact as well as in fun.

Burbidge reports that he has seen Tarsiers, those delightful, but alas very rare, little goggle-eyed toy monkeys of the Borneo forests, scooping insects out of pitcher plants with their paws, standing on the rim and leaning down into the pitcher. In the case of *N. bicalcarata* the two spines would transfix the tarsier in the neck and would be stout enough to do it great injury, even if they did not kill it.

In the stem just at the base of the pitcher, this plant also often harbours a small colony of ants. Their exact relationship with the plant is unknown. The pitchers have fifteen thousand to twenty thousand glands per square inch, or so Professor Macfarlane says.

Nepenthes ampullaria was different from all the other pitcher plants we saw, in that the pitchers were arranged in clusters radially round a climbing liana-like stem. The clusters were arranged one above the other from the ground upwards. The pitchers were small, green-speckled with crimson and the lid did not project over them, but stretched out at right-angles to the pitcher like a handle. The Malays call these pitchers "priok-moniet", which being translated is "monkeys' cooking-pots".

We also found *Nepenthes Rafflesiana*, a most variable species with squat basal pitchers and elongated flagonlike upper pitchers, and *N. Hookeriana*, which is thought to be a naturally occurring hybrid between *Nepenthes ampullaria* and *Nepenthes Rafflesiana*. Professor Macfarlane mentions that a pitcher of *N.*

Hookeriana under observation caught seventy-three cockroaches within a fortnight, having been emptied three times during that period. It is a pity that pitcher plants cannot be grown satisfactorily in kitchens and other places where cockroaches like to congregate.

Seeds of some of the species of pitcher plants collected in Borneo have been germinated successfully in England, but their growth is very slow. The atmosphere must be uniformly damp, but different species seem to like different amounts of light. From the extreme localization of their distribution in the field it would seem that Nepenthes are very closely related to their environment and that any successful grower must follow these conditions as far as possible. I doubt also whether the species from the sand forest habitat and from the moss forest should even be grown together in the same house. At the Singapore Botanic Gardens I was told that they could not grow mountain species of Nepenthes successfully, but had to send them to the garden on Penang Hill.

The pitcher plants hybridize freely in their own environment and there are also many fine nurserymen's hybrids which are more easily obtainable, and possibly slightly easier to grow than the majority of the species. One of the finest is named after Sir W. Thistleton Dyer and it has large pitchers richly blotched with crimson, while the collar is waved and ribbed not unlike that of *N. Veitchii*. It is the

product of a cross between two fine hybrids *N. mixta* and *N. Dicksoniana*, which latter is described as a hybrid between *N. Rafflesiana* and *N. Veitchii*.

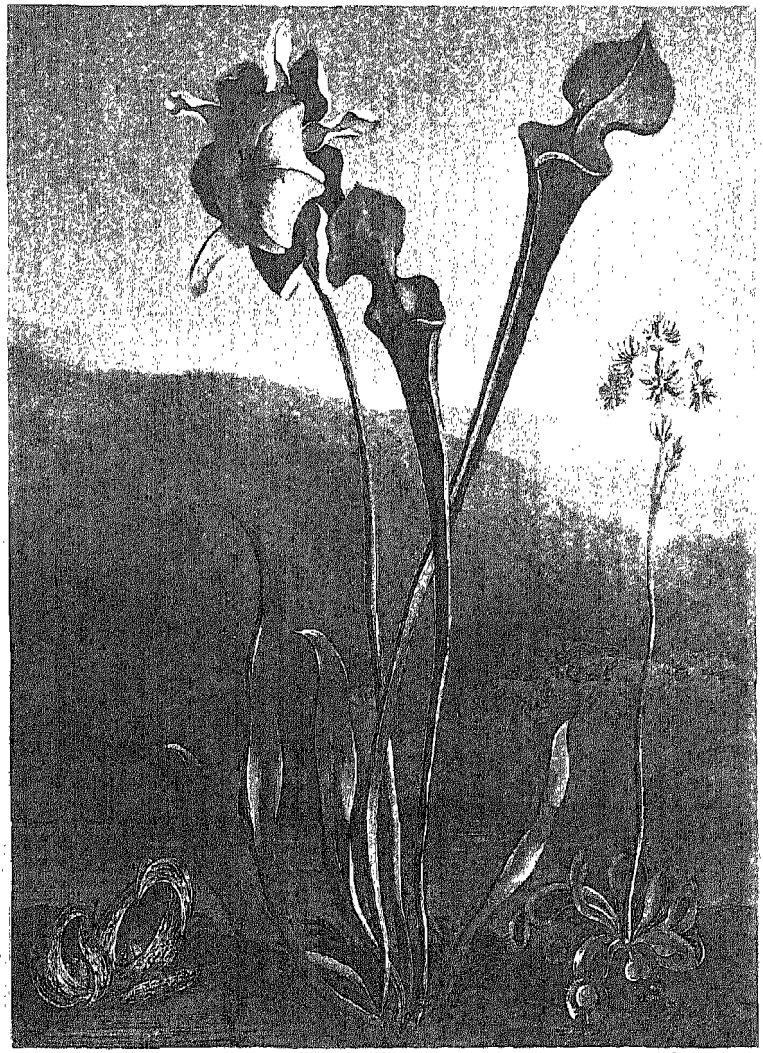
The seeds are usually sown on the surface of a compost of peat fibre and chopped sphagnum in pots drained three-quarters of their depth. They should be placed in a closed frame with a temperature of 70°–75° F. The cotyledon should appear in six to eight weeks and shortly afterwards the first true leaves. These bear minute pitchers sessile at the apex, and with each succeeding leaf the pitchers increase in size. Like many other insectivorous plants, the root systems of Nepenthes are weak and they require a very open rooting medium.

There is one species of Nepenthes in Northern Australia and one in Madagascar. Otherwise they are confined to Southern Asia, Malaya, Borneo, Sumatra and the Celebes. There are, however, somewhat parallel developments both in South and in North America. In South America there is only a single species, *Heliamphora nutans*. It was discovered by the brothers Schomburgh, at six thousand feet in boggy places at the foot of Roraima, Conan Doyle's *Lost World* mountain in British Guiana, in 1839. It was first introduced by David Burke, and the *Hortus Veitchii* records that it flowered for the first time in 1889 in this country. It was also found in 1884 by Mr. Im Thum, at eight thousand feet on the top of Roraima, which would suggest that it might prove hardy in England, or at

any rate be suitable for cool greenhouse culture. It is, however, generally described as a stovehouse plant. The pitchers are pale green, stemless and sessile in the ground. They are not prolongations of the leaf, but the whole leaf as in the Sarracenias. In fact, Heliamphora belongs to the same family. The pitchers are slightly waisted as a more modern maiden, contrasting with the Victorian wasp-waisted beauty of *Nepenthes Lowii*. The mouth is wide and sloping diagonally lip upwards. There is only a rudimentary lid. The plant is very rare in England and I have not seen it in flower.

The print in the *Botanical Magazine* shows several white nodding flowers on each stem and the name must have been derived from this habit. Collectors who have seen the plant growing on Roraima, have recorded that it has prominent red veins on the pitchers, but these do not appear in the cultivated plant.

The Sarracenias are inhabitants of the bogs of North America. Doctor Thornton's fine print probably depicts *Sarracenia flava*, which is one of the finest species. These American pitcher plants also rejoice in the name of *Side-saddle flowers*. The flowers are large, most peculiar in formation, and borne single on the ends of two-foot stems. The buds are globular and held upright, but before opening they reverse their position and the flowers appear nodding downwards. The style is enlarged and incurved upwards so as to form an inverted



Pothos Dionaea

SARRACENIA FLAVA
(AMERICAN BOG PLANTS)

umbrella-like dome below the carpels and stigmas, while the petals, which are bright greenish-yellow, hang down flaccidly between the dome and the sepals in a way which reminded early botanists of a woman's legs hanging loosely from a side-saddle. I can find no other explanation of the curious name. The pollen is shed from the stamens into the flat bowel of the style where it is brushed against insects. The flowers are usually cross-pollinated. Frances Perry in her excellent book on water-plants, also mentions other popular names for these plants—Boots, Forefather's Cup, Huntsman's Cup, Soldier's Drinking Cup, Trumpets, Watches.

There are many species, but only one, *Sarracenia purpurea*, can be regarded as hardy in this country, and although the plant has lived with us outside for several winters in Surrey, it has not made good growth and suggests that it would be better in a cool greenhouse. I believe that there is one bog in the West of Ireland, in Connemara by the Twelve Pins, where the plant has become naturalized. It would probably fare well enough in damp places in the South-West and in the West of Scotland, in such places where Fuchsias form great hedges. In such favoured places, *Sarracenia flava* might also grow satisfactorily outside. It is one of the finest species and has long slender yellowish-green pitchers, sometimes as high as two-and-a-half feet. The flowers are yellowish-green and the pendant sepals a brighter yellow. In the print there is also

Dionaea muscipula, Venus Fly-trap and *Pothos*, the skunk cabbage a curious hardy yellow and brown aroid. The trap mechanism of Sarracenia appears to be less specialized and developed than that of Nepenthes. Nevertheless it is effective and few insects which start on the slippery slope, reappear. There are nectar glands, which secrete drops of sweet fluid around the lid and the rim of the pitcher. Below the rim, the smooth cuticularized cells of the epidermis project their lower edges over the top edge of the cells below, in the manner of tiles on a roof. Below the epidermal tiles is a zone of long bristles pointing downwards. There is usually fluid present at the base of the pitcher, probably partly rain-water, since the lid stands upright rather than covering the pitcher. There is undoubtedly decay of animal matter under the influence of bacteria in the pitchers, but it is doubtful whether there is a secretion of digestive enzyme as in Nepenthes.

There are several varieties of *Sarracenia flava* which are worthy of cultivation. *S. flava var. atrosanguinea* has pitchers tending towards deep crimson in colour, while *var. maxima* has vast yellowish-green trumpets. One of the most striking of the North American species is *S. Drummondi*, but it is more rarely seen in cultivation than *S. purpurea* or *S. flava*. The pitchers are mottled with red, white and green, while the flowers are recorded as white and purple. I have not seen it in flower. *S. rubra*

has medium-sized green pitchers, thickly reticulated with red veins, while the flowers have rich reddish pendant petals. The pitchers of *Sarracenia purpurea* are fatter and much more squat than those of the species already described, and they do not stand erect like those of *S. flava*, but rather sprawl about the ground like great over-fed crimson slugs. Along the breast of the pitcher is a broad wing of green and crimson tissue. The basic colour of the pitcher is green, but it is so streaked and veined with crimson that the general appearance is purplish-crimson in colour. The pendent petals are dull crimson and the flower is attractive, but these are seldom produced in the open in England.

Sarracenia purpurea extends as far north as Labrador and sub-arctic Canada. American botanists distinguish two forms, *S. purpurea gibbosa*, the northern, and *S. purpurea venosa*, the southern, but there are many intermediates. The northern form was brought to Europe very early and was figured by Clusius in 1601 in his *Historia Plantarum variarum*.

Allied to Sarracenia is that peculiar plant *Darlingtonia californica*. It is also insectivorous and the pitchers are borne on radical leaves as in Sarracenia. It grows in the giant Redwood zone of California, north of San Francisco, probably the finest belt of forest trees in the world; also it extends up the Sierra Nevada to five thousand feet, where it grows among rushes and sundews. It is not hardy in this

country. The pitchers are strange indeed, often three feet in height in their home, although seldom so much in cultivation in England. The top of the pitcher turns over to form a small dome, while the wing of the pitcher broadens out at the top and forms a lateral fish-tailed extension often several inches across. It is rigid in young pitchers but in the old pitchers it is inclined to droop. Lester Rowntree in her book *Hardy Californians* (hardy in Eastern U.S.A., not in England) compares it to a seal lifting up its head preparatory to barking. Always the pitchers remind me of some gigantic slug with horns extended. The basal colour of the pitcher is green, but it is very heavily veined with deep crimson and the fish-tail is generally pink or crimson. The name *Chrysamphora californica* is now used by some American botanists in place of the name Darlingtonia. It is derived as golden pitcher, but I have never yet seen a pitcher of Darlingtonia looking golden.

Darlingtonia and Sarracenia are bog plants and require to be kept moist throughout the year. Mrs. Perry recommends as a general compost one-third chopped sphagnum moss, one-third sifted loam mixed with a little silver sand, and one-third fern fibre (with the dust shaken out). The pans should be given a liberal allowance of crocks so that the drainage can be kept open. All such pans look better if they are finished with live sphagnum moss.

If a number of insectivorous plants are grown, it

would be pleasant to make them up into a bed in the cool greenhouse, either planting direct into the bed or plunging the pots up to the rim in damp peat moss and finishing off with Sorbex and Sphagnum. Such a bed has been made at Kew. Always I prefer the natural effects of a planted bed in a greenhouse to a staging covered with pots. In the case of just a few plants it may be well to cover them with bell-jars so as to keep the atmosphere around them moist. Alas, bell-jars are distressingly expensive, since they are most useful adjuncts to the growing and establishment of plants which need a constantly moist atmosphere around them. They are also a great help in striking cuttings. Any house in which Sarracenias are grown will need to be shaded during the summer. Preferably it should not face due south.

The Droseras always attract me because of their graceful filmy, feathery appearance. They sparkle like dew in the sun and from this indeed is derived their name "Sundew". There are three species native to English bogs—*Drosera rotundifolia*, the common round-leaved Sundew, *Drosera longifolia*, the oblong-leaved Sundew, and *Drosera anglica*, a rarer and slightly larger edition of the latter, possibly a hybrid between the two former species; but the greatest glories of the genus are the Australian and the Cape species *Drosera binata* and *Drosera capensis*. There are forty-one species recorded from Australia and eight from the Cape.

In *Drosera binata* the leaves are all radical, generally five to six inches long and deeply forked. Occasionally they are as much as a foot long. They are narrow and strap-shaped and often slightly curved towards the tip. The leaves are thickly covered with crimson hairs bearing at the ends round glands like the head of a pin. These glands and the hairs are covered with a sticky viscid fluid which makes them shine like dew-drops. The flowers are white, veined with yellow and are much larger than those of the English species. We rarely notice the flowers of the English species, since these do not usually open, but are self-pollinated in the fluid.

The finest flowers in the genus are probably those of *Drosera cistiflora* from South Africa, but it is very rare in cultivation in England. There is an excellent plate of it in the *Botanical Magazine*, which shows brilliant scarlet flowers about two inches across. The flowers are simple and in form resemble an enlarged Saxifrage to which family the Droseras are closely allied. They are, however, borne on a stem about a foot in height.

Drosera capensis is a fine plant with leaves growing almost erect from a very short hard stock. They are narrow, strap-shaped, almost linear and very thickly covered with long sparkling hairs bearing glands at their tip. The flowers are deep pink in colour, about an inch in diameter and several are carried on one stem. All these species grow best under damp conditions in the cool greenhouse as described for

Sarracenia, but there are a few species such as *D. Whittakerii* from Australia, which have a tuberous root stock and are adapted to withstand a period, when their bog becomes dry and is baked hard. They are very rare in cultivation in this country.

From Portugal and Spain there comes an interesting relative of the Droseras, *Drosophyllum lusitanicum*. It has a short, woody stem from which arise linear leaves, glandular and sparkling like those of Drosera. The flowering stems, unlike those of Drosera, bear leaves. The flowers are yellow, somewhat like those of *Linum arboreum*. In two ways this is a peculiar plant. Although the leaves have stalked glands as in Drosera, these are not endowed with any motive power as are those of Drosera, which curve towards their captured prey and finally enmesh it. Nevertheless the plant is quite effective as a fly-catcher and the Portuguese are said to make practical use of it by hanging it up in their houses like fly-papers. The other peculiarity of Drosophyllum is the folding of the young leaves in the bud. They are rolled the opposite way to those of all other plants, being circinate and revolute rather than involute. As far as I know there is no other plant like this. Drosophyllum is an inhabitant of hot, dry places, sandy places by the sea-shore and rocky places inland, and needs to be grown under much drier conditions than Drosera.

The insectivorous habits of the Sundews are of

great interest and as far as I know Charles Darwin's famous account entitled *Insectivorous Plants* still stands good as the leading book on the subject. It is certainly a fascinating volume.

When an insect alights on the leaf, the glands are stimulated immediately and secrete a thick glutinous fluid which effectively bogs the insect like a small car on an African road after rain. If the insect touches several of the marginal tentacles these gradually bend towards the centre, thus partially rolling the fly towards the central glands which do not move. Within a very few minutes it is completely enmeshed and covered by the sticky fluid and the stalked glands which bend like tentacles. They are often given this name and it seems appropriate to me. The marginal tentacles are much longer than the central ones. Although the tentacles are stimulated by contact, only contact with organic material, a fly, a small piece of egg-white or even ammonium sulphate causes a secretion and a prolonged movement in the tentacles. Contact with an inorganic material such as a small stone or a piece of metal does not cause any secretion and only a very limited movement. Quickly the tentacles resume their former position, shining and sticky, attractive to the passing fly.

There is undoubtedly the secretion of a digestive enzyme of the nature of pepsin. There is also secretion of an acid since pepsin is only active in an acid medium. The period of digestion depends on

the size of the captured insect. A fair-sized fly may take several days. There is nothing left except the wings and chitin of the body case. Then the leaf opens again ready for another catch.

Even more exciting is *Dionaea muscipula*, Venus Fly-trap, a wonderful plant from North American bogs. It is shown in flower in Doctor Thornton's fine plate. A good specimen should have six to eight leaves arranged like a rosette. The blade of the leaf is borne at the end of a winged stalk several inches in length. The wing does not join the leaf and there is a very small part at the end of the petiole which is unwinged. The leaves are fleshy and consist of two semi-oval lobes jointed at a strong mid-rib. They are glandular, and along the edge is a series of long fine tooth-like hairs. On the upper surface of each lobe of the leaf are three sensitive bristles. If these are touched the two halves of the leaf suddenly snap together, the marginal teeth interlock and the prey is securely trapped. The whole movement is complete in less than a second. It has been shown that at ordinary temperatures two successive touches are necessary to produce action, but that at higher temperatures one shock is sufficient. Any insect blundering on to the leaf would inevitably make contact with the bristles several times. The movement is thought to be due to changes in turgor pressure within the cells and it is fixed by differential growth.

There is only one other plant which can move

like this—the famous sensitive plant *Mimosa pudica*. Digestion proceeds as in Drosera and the leaf reopens within a few days. Dionaea is hardy in the warmer parts of this country, but it is more often grown in a cool greenhouse so that its mechanism may be more easily observed and the plant cared for in an even humidity, for it is somewhat fussy of its conditions in cultivation and is not a very easy plant to grow satisfactorily. For this reason it still remains uncommon and rather expensive in England, although it has been introduced for several centuries.

The genera Utricularia and Aldrovanda are for the most part aquatic insectivores, and we will not discuss them here, although their mechanisms are most peculiar and of great interest. They are not, however, plants of horticultural value. There is, nevertheless, one errant Utricularia which is an epiphyte in the mountains of the West Indies. It is *U. montana* and its general appearance is more Orchidaceous than insectivorous. The flowers are large, white with a yellow palate and disc to the lower lip. The bladders are only rudimentary and are developed on the fibrils of the roots. They are minute and imperfect. There are also small hollow tubers which bear a superficial resemblance to the pseudobulbs of an orchid. The plant requires stove-house treatment in this country and is very rare. I have not yet seen it.

There only remains now one further genus of

insectivorous plants to be discussed. *Pinguicula*, the butter-wort. *P. vulgaris* is common in boggy places in England, while a finer species, *P. grandiflora*, is found in a few stations in the West of Ireland. The flowers are pleasant, deep violet in colour, lightening towards the centre, superficially not unlike a giant spurred violet, and indeed they are sometimes called bog-violets. The leaves are brilliant green, fleshy, sticky and shining. When an insect alights its feet are held by the stickiness of the leaves and around it an acid digestive fluid is secreted. There are no tentacles and there is no movement as in Drosera or Dionaea, but yet the trap is effective and the remains of many small insects can often be seen.

Probably the species with the largest flowers is *P. caudata* from Mexico. Sometimes the flowers are two inches across. In one variety they are pink, in another deep violet. The plant is sometimes grown in warm orchid houses in order to catch small midges.

It is not known how this insectivorous habit has been developed in plants. Many of the groups are systematically widely separated, which suggests that it may have evolved separately in different continents, although along parallel lines. Macgregor Skene in his book, *The Biology of Flowering Plants*, records that pitcher formation on leaves is not uncommon as a sport in many plants and quotes the cabbage as an example. All the plants I have discuss-

ed here can apparently live and even thrive without insect food, but they are all plants with poorly developed root systems, and they are mostly inhabitants of places where the supply of available nitrogen is limited.

IV

FLY-POLLINATED PLANTS

WE HAVE written almost *ad nauseam* about the pure, inhuman and almost celestial beauties of plants such as Magnolias and Lotuses and the cunning beauties of Nepenthes and Sarracenia. Now let us turn to the drunken roisterers of the plant world, the brown- and purple-spotted flowers which rely on flies for their pollination, coarse and aggressive in their stench. There is surely some attraction also in them. They are the true mediævals; to me Aristolochias and Rafflesias are like great Henry VIII's swanking and bloated, advertising their presence a mile off.

In Europe we have no tropical giants like Rafflesia or *Aristolochia gigas*, but we have *Arum dracunculus*, the Dragon Arum, which grows round the shores of the Mediterranean. Dr. Thornton's print represents it as a dark mysterious plant against a landscape of storm, lightning and thunder, the accompaniment of "witches, blasted heaths and cauldrons", and so it seems to me.

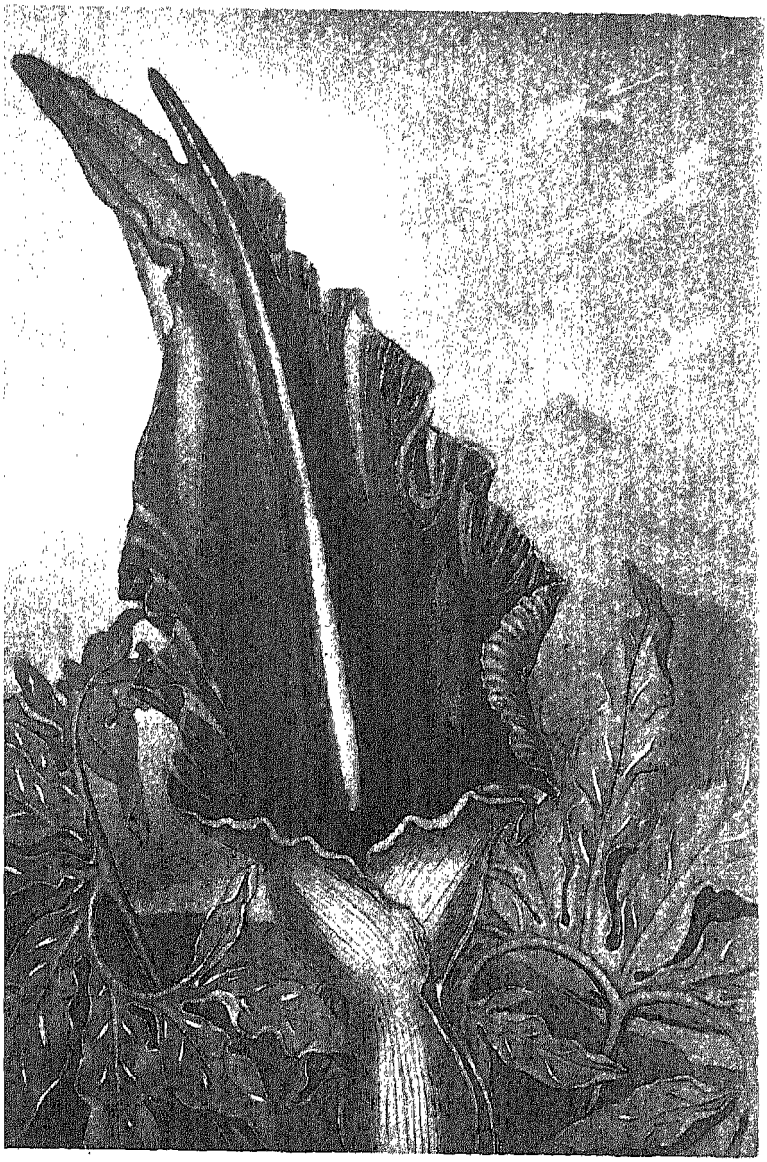
From speckled stems and well-divided, slightly fern-like and rather handsome foliage rises the great flower, often three feet high from the ground,

a dark maroon spathe, velvety and glistening, shaped like a funnel open at one side and slightly crinkly at the edge. In the centre is a dark spadix, a viperous round tongue, gleaming wickedly, a tall Satan in the pulpit rather than the harmless Jack in the pulpit of the wild English Arum.

The Dragon Arum is hardy in Southern England, but is best grown in a sunny border at the foot of a south wall. The round fleshy tubers should be planted in autumn and the flowers should open in early June. We had two plants in flower recently. For two days they were most spectacular, then perfectly beastly when they began to go over. They seemed to go bad, brown and rotten at the same time and the spadix heeled over like one of the melted wax-works described in C. E. Montague's story.* For several weeks we had watched a long green spike almost visibly swelling, then the maroon tip of the spadix appeared and finally one morning I found the flower bust, the spathe opened revealing the wonderful deep inside colour. Little hint of this appears outside. The flies congregated. Unfortunately our Arums had found themselves near neighbours to a beautiful crimson Leptospermum from New Zealand which flowered at the same time. They were indeed ill-assorted neighbours, the one so coarse, the other so jewel-like. Next year they shall be parted.

Like the majority of fly-pollinated plants, the Dragon Arum smells like a particularly offensive

* "à Propos des Bottes" from Fiery Particles.



THE DRAGON ARUM

piece of bad meat; still provided the wind is not strong, this is not too bad in the open, although it would be impossible in the greenhouse. Other kinds which are not quite so large and so strong smelling are *Arum sanctum* (sometimes called *Arum palaestinum*), the black Arum which flowers in May and June, and *Arum italicum*, which has yellowish-green flowers in March and April.

Recently I saw an even finer species shown at one of the R.H.S. shows. *Arum dioscorides var. spectabile*, a wonderful exciting flower, funereal like black velvet, the kind of flower that Philip of Spain might have chosen to deck the funeral ceremony which he carried out for himself during his own lifetime, a flower like the man, essentially aristocratic, but macabre, fanatical and bigoted to an extreme degree. Such a flower might also have been worn by one of the female Borgias. The spathe was very deep velvety maroon, thick and much silkier than the Dragon Arum. It was recurved backwards away from the spadix which was almost jet black, about eight inches long and fringed at the base. Outside the spathe was green. There was no devastatingly offensive smell as in *Arum dracunculus*, but just a faint smell, reminiscent of that of a mature wine cellar. Only this once have I seen this flower and I have no knowledge of the country from which it comes. I doubt if it would be a hardy plant. Nevertheless it attracted me very much.

Aristolochias are called Dutchmen's pipes, and it

was in Java at the wonderful botanic gardens of Buitenzorg that I first saw the largest of them all, *Aristolochia Sturtevantii var. gigas*. It is really a native of the rain forests of Brazil, but in Java it was growing freely, as indeed was everything in that garden, which must be the most luxuriant in the world and also one of the most interesting and beautiful. Here one sees the real luxuriance of the tropics mixed with the arts of the gardener but yet not curbed unbearably.

One enters into an avenue of vast Canarium trees at least one hundred feet in height, the trunks clothed with lianas and climbers, rampant aroids and rattans, the branches with epiphytes, orchids and vast ferns. Here was *Grammatophyllum speciosum*, the largest known orchid with brown and orange flowers on six-foot spikes and leaves somewhat resembling those of a Pandanus, hanging down in a graceful curve, twitching to and fro in the wind. In Java they call them Elephants' tails. I have read that from the seeds of this marvellous orchid there has been made an elixir which is said to be the true elixir of love. Alas, I never found the plant in seed.

Morning or evening is the best time to visit the garden, as then the sun is low and casts pleasing shadows among the trees. At mid-day the garden is rather hot for comfort and does not possess quite the same charm that is found in the earlier morning or in the evening. There is a certain harshness about the Tropics at mid-day that most residents prefer to

avoid. In the East the world rises early and many enter the garden at six or seven in the morning.

The brown and white buds of the Aristolochia give little warning of the gorgeousness of the open flower. The bud is rather like a battered and slightly dried dead leaf floating among the green foliage. Then suddenly it opens, a great loudspeaker trumpet of a flower. One almost expects it to blare forth the national anthem or the latest hot jazz tune. It represents a fascinating pattern of browns, deep maroons and light creams, spotted and mottled; in the centre a great dark mouth, behind which the throat vanishes backwards and downwards. Often a foot across, the flower is longer than it is broad, and from the tip dangles a tail, twisted and crinkled like a little pig's tail, but several feet in length. I felt tempted to pull it and start the music. In the open air I did not find the smell objectionable, although in the hothouse at Cambridge it is sometimes overpowering when the house has been shut for some time.

There are, however, other Aristolochias whose scent is not so bad. I grow one in my small greenhouse here under the label *Aristolochia braziliensis* which seems to have practically no scent, and its flowers look like a slightly drunken and browned, withered old dame flat and fan-like, nodding from the roof. They are about three or four inches across and rather more in length and do not require much heat. I have also another Aristolochia under the same label and grown under the same conditions,

which has a flower much darker in colour, almost solid maroon and stenches most repulsively. In fact, every year I ponder the idea of throwing away the plant, but it is still with us. There is also a delightful little scrambling Aristolochia from Crete of which I recently acquired a tuber from my friend's, Mr. Peter Davis's, expedition. I have not yet seen it flower, but his photograph shows a brown and purple flower delicately fringed round the edge, and he suggests that it might prove hardy.

My third genus of fly-pollinated plants comes from South Africa, the Stapelias, the carrion flowers, the star-fish flowers. I prefer to think of them by the latter name, for some of them really only smell just a little. I have grown *Stapelia variegata* for some years and it seldom fails to flower. The flowers are deep chocolate maroon in colour, splashed with entirely irregular cream markings. In shape they are not unlike a large five-pointed starfish, strangely geometrical and regular in shape. The centre is formed by a circular disc with a raised rim and divided by five cream-coloured spokes and between them five stigmas. Outside this are the petals, which form a five-pointed, blunt star, several inches in diameter. There are no leaves and the flowers hang down from succulent stems, a background of mediæval castles and towers, slightly Gothicized. They are attractive by themselves when the plant is not in flower. Often the stems have a purplish or a mauve tinge.

STAPELIA

This Stapelia is a very variable plant and there are numerous named varieties. The darkest is *var. marmorata*, the lightest *var. picta*.

The largest Stapelia is probably *Stapelia grandiflora* which has stems a foot in height and flowers often six inches in diameter. Another most peculiar kind is *Stapelia hirsuta*, which has beautiful velvety stems and maroon flowers not opening into a star as in *Stapelia variegata*, but semi-closed like a small balloon or even like a little animal crouching to spring. Where the edges of the petals are recurved, there is a double row of long violet-coloured hairs.

Stapelia engleriana is even more peculiar in flower. The petals are recurved completely, making the flower like a round ball with an eye in it. The eye has a dark centre and is surrounded by a white zone before the pattern of the petals appears in waving concentric rings round the eye. It is like a fish's egg about to hatch, or a bird's eye goggling at a strange apparition.

Stapelias are easily grown in a slightly heated greenhouse or even in a living-room, since they do not want a humid atmosphere. Practically no water at all should be given them during winter when they are resting. They are easily propagated from cuttings taken in the spring and allowed to dry off for a time on the bench, so that the cut is calloused over before planting. An open sandy compost will suit Stapelias and they should be treated like other succulents.

The adaptation of fly-pollinated plants is two-fold. There is not only the colour and appearance of bad meat, but also the smell. Yet the smell is presumably not the result of decomposition or bacterial action. It is an intrinsic quality of the flower, although by what chemical means it is produced, I do not know.

The largest flower in the world is *Rafflesia*, a parasitic inhabitant of the jungles of Borneo and Sumatra. It is also fly-pollinated and so is the next largest flower, its rival in size—*Amorphophallus titanum*, and this also comes from Sumatran jungles.

During the Oxford Expedition to Borneo Jungles, we once found buds of Rafflesia, although I do not think that they were buds of the largest species. Unfortunately, our Malay assistant cut the root on which they were growing, with his parang, and they never opened. They were then about the size of a baby's head. We never found any more.

I have never seen *Amorphophallus titanum*, but I have seen photographs of it flowering in the New York Botanic Garden, and I believe that it has also bloomed at Kew. It is a gigantic and monstrous aroid and grows at an incredible rate, sometimes six inches a day until it opens at a height of eight and a half feet. The mature inflorescence is said to give off an offensive scent, resembling the smell of decayed fish. The inflorescence consists of a gigantic fleshy spike pale-green in colour, with touches of white. This spike emerges from the centre of a

spathe, a sheath which at first surrounds it and then opens like a rococo sea-shell with a fringed edge, displaying a rich maroon or liver-coloured inside. It is like a vast Arum lily in which the spadix has outgrown the spathe. Amorphophallus grows from a cheese-like tuber which may attain a circumference of four or five feet. There is also a smaller species of Amorphophallus, *A. rivieri*, sometimes called devil's tongue, which has a dark red spathe about three feet long and not unattractive much-divided foliage.

V

SUN LOVERS OF SOUTH AFRICA

ONE OF the most beautiful birds I have ever seen was the crested crane. In the same way one of the finest plants I know is the crane flower *Strelitzia reginae*. The two are astonishingly similar in appearance. There is the same regal diadem and crest, the same graceful and dignified carriage; in each brilliant colours, provocative and challenging, seem to cast a javelin at the world. The flower is indeed like a brilliant bird darting through the air and it is one of the few flowers which are bird-pollinated. The pollen is transferred from one flower to another on the breasts of little sun-birds. They perch on the sheath formed by the two lateral petals and depress these so that the anthers are forced out of the tube and dust the breast of the sun-bird with pollen.

This plant was first introduced into England in the reign of George III. When it flowered at Kew it was by such a long way the most exciting new flower that had been seen for a long time, that Sir Joseph Banks named it after the Queen. She was Sophie Charlotte and had been a Princess of Mecklenburg-Strelitz before marrying George III.

So the flower was named *Strelitzia reginae* and is still often known as the Queen flower.

The plant is a large one, often four to six feet in height and as much across in an old-established clump. The flowers are borne in a sheath flushed pink or purplish beneath. This sheath is nearly always inclined horizontally like the keel of a boat, almost at right angles to the stem. The flowers spring out of it, generally one or two at a time like the crest of a bird from its head, or the sail from a boat.

The fine print of Rheinagle from the Temple of Flora shows well the magnificence of the flower and its complications. There are three brilliant orange petaloid sepals, two of which stand upright, flickering like flames, several inches in height, while the third lies flat along the keel, only to be pushed upwards by the next opening flower. The petals are deep coerulean blue in colour and with the stigma form the javelin-like part of the flower. Two of them are elongated and joined together down the centre, forming a kind of tube to protect the style and the stigmas. The base is broadened and forms a landing ground for the birds. These petals also have a special frilled flap which protects the pollen from the rain. The third petal is central and much smaller. It serves to protect a supply of nectar from the rain and is slightly hooded. It forms the small blue piece in the centre of the flower in the picture. The stigma projects well beyond the petals and

THE QUEEN FLOWER STRELITZIA REGINAE

forms the point of the javelin. The anthers do not appear until the petals are pressed down and the frilled flaps separated by the weight of the sunbird.

This curious flower belongs to the banana family, the Musaceae, and the leaves bear a distinct resemblance to those of the banana, although they are far more tough and leathery, since the plant has to withstand a hot, dry period every year. There is a stout round petiole, several feet in height, and above that a broad lamina, often eighteen inches in length, veined like the leaf of a banana. The flowers and leaves mingle well together.

The Queen flower grows at the Cape, particularly along the banks of streams and in open glades of the bush.

In England, Strelitzia can be grown very successfully in a cool greenhouse. It should, however, be planted out in a bed of soil and not confined to a pot. The soil should be well drained and not too heavy. I have not heard of its successful cultivation out of doors in England. Under greenhouse conditions the plant grows quickly, and when established will flower every spring. There is a succession of flowers bursting out from the pink sheath which may last for several weeks and may well justify the illusion that there is an exotic bird in the house. As well as the name Crane flower, they are sometimes called Bird of Paradise flowers. There is a fine clump in one of the greenhouses at Kew.

There are two other species which are occasionally grown, but they are much rarer than *Strelitzia reginae* and, to my mind, not so desirable. *S. augusta* is a much bigger plant, often reaching ten feet in height, and comes from the coast regions of Natal. The plant was thought to be a wild species of banana when it was first discovered. The flowers are white. There is also a species *S. parvifolia*, which has enrolled leaves resembling those of a rush and no lamina. The flowers are similar to those of *S. reginae*.

The Cape flora is very rich indeed in flowers of horticultural value. In the last century every greenhouse grew heaths from the Cape; now they are very rare, but I believe that we are experiencing a certain revival in the more hardy Cape plants and the bulbs, in the same way as camellias are returning to popularity.

A striking example of this is the great popularity of the Barberton daisy *Gerbera Jamesonii* and its numerous hybrids. These are even grown in small quantities now for the cut-flower market, but they still are priced high in florists. They are the most graceful and charming daisies that I know, and I have not yet seen one in an unattractive colour. The actual species is pinkish-flame coloured in flower, and often the flowers are as much as four inches in diameter.

In writing of Composites in this book, I must ask the indulgence of strict botanists in referring to the

Capitulum as the flower. This disc is small and yellowish-green in the centre. The outside is a ring of opened disc florets, in colour the same as the long ray florets which surround it, forming a perfect and graceful circle.

The Gerberas seem to be unusually clean, brisk flowers, with the brightness, although not the excessive gaudiness, of Africa; but they have nothing of the languor and voluptuousness of so many plants of the Pacific and the Indies. They are not really tropical flowers, nor is their habit tropical.

Gerberas have a reputation for difficulty in growth, and I think this is largely due to two factors: the first, their dislike of root disturbance and of confinement in small pots; the second, the very short viability of the seeds. I have found that they do well if established in a cold frame, against the wall of a small greenhouse. They are planted in the soil of the frame and left entirely alone except for an occasional mulching with leaf-mould. The lights of the frame are left off all the summer and in the winter during mild weather. Always as much air is given as possible. In this way we have had a constant supply of flowers from fewer than a dozen plants, never a great abundance, but always a few, almost as many in winter as in summer. I picked several excellent flowers from them this morning in the middle of December. In the winter we diminish the amount of water given, but we do not dry off the plants completely at any season. I do not know

whether this might be desirable. While the plants would probably survive the trial, I have never thought that they seemed to require such a complete rest and baking as is needed by Cape bulbs such as Nerine. In the warmer parts of the country, Gerberas might well be hardy under a south wall or in a warm border.

There are now innumerable hybrids of Gerbera on the market, and there are even some double forms, in which the centre of the flowers is filled with a mass of modified ray florets, about half the length of the outside ring of ray florets. While these are undoubtedly attractive, I myself still prefer the single varieties. Some of the new hybrids have produced flowers as much as six inches in diameter and four inches is quite common. They last particularly well as cut flowers in water.

Gerbera Jamesonii grows on the eastern slopes of the Drakensburg mountains, where it is said to be common between two thousand feet and three thousand five hundred feet. It grows in the gardens at Pretoria at four thousand five hundred feet and withstands several degrees of frost and probably it will do the same in England. The plant was originally described by the Honourable R. Jameson of the South African Legislative Assembly, who found it on the goldfields near the town of Barberton. Hence the name, a happy blend of discoverer and locality.

There seems to be an innate variability in colour in the Barberton daisies, but this has probably been

GERBERA JAMESONII

increased by hybridization with other species of Gerbera such as *G. aurantiaca* and *G. viridiflora*. I have heard even of a violet variety, although I have never seen it. The seeds of Gerberas seem to have a very short viability and for good germination they should be sown immediately they are ripe. Six-months-old seed is seldom any use.

There are many other species of Gerbera in South Africa, and according to their descriptions several of them should make fine garden plants and I hope that they may be soon introduced in the species as well as in the hybrid.

Gerbera asplenifolia has leaves like a simple leafed Asplenium fern and flower heads one-and-a-half inches to three inches across, pure white above and red below. I feel that it might also form a useful hybrid with *G. Jamesonii*, of which the foliage is quite distinctive, but has a tendency to be a bit coarse. Then there is *G. Wrightii*, which also has white flowers and grows in the Cape Peninsula. *G. aurantiaca* has large flowers often dark blood-red above and three inches in diameter. The leaves are covered with a white cobwebby indumentum below, especially on the midrib. This white cobweb indumentum is a most attractive feature in plants, but I have nearly always found that such plants are difficult in cultivation in this country. The only exception to this is *Sempervivum arachnoideum*, which is a very easy plant to grow. *G. aurantiaca* comes from Transvaal and from the

Eastern regions of Natal. It grows as high up as six thousand feet, and so it is not unlikely that it might be hardy in the warmer parts of England.

The shrubs of the Cape, particularly the Proteas and the Heaths, have long been famous, but, alas, very few indeed are in cultivation in England to-day, probably many fewer than a hundred years ago. They need re-discovering and re-introducing to-day. There are even cycads, species of *Encephalartos* and one of *Stangeria*, delightfully called *S. paradoxa* because, as one book explains, "by appearing so like a fern and really being a cycad, it contradicts itself". But cycads are only for those with large greenhouses and for botanic gardens. They are not hardy in England.

The Proteas also seem to be difficult of cultivation in England. Probably they would only be hardy in the very warm parts of the South West of England, and these parts are in many cases too damp for successful cultivation of South African plants, which come from a region of dry atmosphere. Undoubtedly the humidity is a most important factor in the growth of plants from distant regions. The West of England is considerably more humid than the East; ferns and mosses clothe the lanes. Consequently many of the Himalayan and even the plants from the Chilean Andes, and also the plants from the Equatorial mountains of East Africa, which live much of their time in a mist in their own environment, grow more freely and luxuriantly in the

West than the East. The extra humidity also acts partially as a blanket against extremes of temperature.

Nevertheless, the Proteas are lovely plants. The South Africans call them honey-pots. As a genus they are peculiarly African. I found one fine species on Mount Kenya and Mount Elgon in East Africa, but the best are undoubtedly South African. Ernest Wilson, the famous plant explorer and collector, introducer of *Lilium regale*, even writes that in his judgment "the handsomest inflorescence in the world is that of *Protea cynaroides* seen on its native heath". The South Africans call it the King Protea and it is the most widely distributed member of the genus there. The plant is named *cynaroides* after the globe artichoke Cynara, and this resemblance will suggest its form to those who are unfamiliar with it, quicker than any description. The flower heads are, however, larger than those of the globe artichoke, being often eight inches in diameter. Incidentally, the globe artichoke is a fine plant for the back of the border, with its early silvery-grey, much-divided leaves and its great blue flower heads, and should be more cultivated than it is. Unfortunately, if it is picked for the table the flowers are lost and I prefer to see its flowers rather than to eat its buds, which I consider a much overrated delicacy and hardly worth the extreme mess and hard work involved in their consumption.

The flowers of the King Protea are very con-

spicuous. They are cup-shaped, a foamy mass of stamens surrounded by pink bracts standing out stiffly like an Elizabethan ruff round a youthful head with fair curls. There are such portraits and they have much charm. It is a generous and dignified flower and it provides much honey for the delightful little sunbirds which pollinate it. In all Proteas, the corolla is absent and its place is taken by numerous imbricating bracts. The King Protea may grow as much as ten feet high, but it is not often so large. The leaves are entire, tough, leathery, glossy and often crinkled. The involucral bracts are variable in colour, sometimes almost white, more often a silvery rose. The plant is said to favour rocky places. There is a fine illustration of this plant in the first volume of Ernest Wilson's *Plant Collecting*.

There are many other Proteas also which are attractive. There is the woolly bearded Protea in which the involucre is made up of fine pink scales, and each scale has its edge bearded with fluffy white hairs. These giant flowers stand upright on stout branches with tough grey-green leaves, edged with crimson. The bushes of this Protea are only two or three feet in height, and it flowers during August, September and October. Undoubtedly it is better to look down on a Protea from above into the centre of the cup, than to look upwards at it. So they should be planted accordingly, possibly on terraces. *Protea grandiceps* is another fine species, with large, deep pink, almost orange-scarlet flowers and oval leaves.

It was found more than a hundred years ago by the traveller Niven on Devil's Peak in South Africa.

Protea pityphylla, the long-leaved mountain rose, is a representative of a rather different group of proteas, those with fine leaves like pine needles and more open flowers. The picture I have before me shows *Protea pityphylla* as a most charming crimson-flowered species with flowers much more open and less congested than the species we have already discussed. I have not seen the actual plant but its picture suggests to me a brighter *Paeony Delavayi*, and it should be a most attractive plant. Then there is *Protea Dykei*, whose picture looks like a pink pincushion complete with pins stuck about.

Protea mellifera is the true honey-pot, the sugar bush of South Africa. It is very common and often covers large areas with scrub, especially in sandy places. The flowers are pink.

All Proteas have beautiful feathery seeds, often reddish-brown in colour, shaped like small parachutes, and these are produced in great numbers from the vast heads.

It is extremely sad that Proteas are so rare in England. It should be possible to cultivate them in cool greenhouses, in which the atmosphere is not kept too damp and there is always a chance that a trial of the numerous species might yield just a few which would be hardy in England in warm situations, as are indeed many of the bulbs from the same region.

Still rare, but yet slightly commoner in England than Proteas, is *Leucadendron argenteum*, the silver tree, known in South Africa as "Witte boom" (white tree), a glorious plant whose leaves are thickly clothed with a white silky down and gleam like burnished silver in the sunlight. In the Cape it forms fair-sized and much-branched trees, but in England I have never seen a large specimen. We have a young tree about two-and-a-half feet in height, which we plunge outside in the summer in a warm corner, and it seems to catch the light from all over the garden and to throw it back at us with renewed brilliance and energy. For after all light is a form of energy. I have been told, though, that Leucadendron is not very long-lived in this country, or indeed in New Zealand, where in many parts it can be grown out of doors. It is also very sensitive of root disturbance. The flowers are inconspicuous and are aggregated together in clusters very like cones.

With the Proteas, the heaths are the most important shrubs and small trees of South Africa, and we must deplore that there are so few kinds in cultivation in England to-day, although a hundred years ago there were very many more. Now they must be re-discovered and brought to England again, for many are very beautiful. Andrews in his wonderful work on *Heaths*, published in four volumes between 1802 and 1830, gives coloured plates of no fewer than 288 species and varieties, all

of which were drawn from plants which had flowered in England. Now there are perhaps not more than half-a-dozen.

Erica melanthera, with small white bell-shaped flowers, and *Erica ventricosa*, with pink bottle-shaped flowers, are grown for the Christmas flower market, forced into masses of bloom and generally dying afterwards. Hundreds are sold every Christmas, but I never see any surviving and forming big specimens. Our ancestors grew these plants in greenhouses and orangeries, heated in winter. They gave the plants plenty of attention. When the price of coke rose and there were fewer hands to attend to them, the cultivation of Cape Heaths declined.

As pot plants, they are not suited to the amateur, they require too much attention, but in many of the warmer parts of the country I think that it might be worth trying some of the species from the mountain out of doors. One of the most exciting is *Erica cruenta* with long crimson flowers, curved so as to accommodate the better the little humming-bird's bill, which pollinates the flowers.

Another striking plant is *Erica Walkeria*, which has masses of pale pink flowers, rather waxy-looking like the flowers of a Daphne.

Erica ventricosa, the pink bottle-flowered heath, sold in English shops about Christmas time, comes from the mountains and has been recorded as high as five thousand two hundred feet, which should point

to a possibility of hardiness in some of the milder counties. However, I have never seen or heard of a plant of it growing outside, so perhaps it does not survive. In South Africa it forms a bush six feet high. Mr. Bean reports that *Erica melanthera* (more correctly although very rarely called *Erica canaliculata*) can be grown outside in Cornwall and will last in flower for three months. *Erica pageana*, a species with rather large yellow bells, can also be grown.

But there is still some leisure among the gardeners of Europe and probably greater care is bestowed on difficult plants than ever before. The shows of the Alpine Garden Society alone would prove this. Is it then too much to hope that we may see a revival in the cultivation of the Cape heaths?

In special relation to the Cape heaths, Doctor Bolus, the leading authority in South Africa, quotes Maeterlinck's famous words, and they are very appropriate: "Has this earth of ours a fairer ornament of its hours of leisure than the care of flowers?"

South Africa is famous also for two other classes of plants: its bulbs and its annuals, and these come into the English market and garden in a steady stream. Many of them have proved themselves very adaptable to cultivation in England. We have abundantly the Belladonna lily, the Nerine or Guernsey lily, the white Arum lily and annuals such as the glorious Ursinias and Dimorphothecas. Both these classes include some of the most gaudy plants

in cultivation, striking the eye like flames on a summer day.

One of the brightest of the flowering bulbs is *Homoglossum Merianellum*. The South Africans just call it "Flames". It is not in general cultivation in England. I don't know why. Even in South Africa it only occurs over a small area in the Cape Peninsula. It seems to me specially important that plants which are rare in their own homes should be in cultivation; so that if any accident should cause them to die out in South Africa, the gardeners may send back bulbs to the wild and original homes, thus repaying in a very small respect some of the great debt we owe to South Africa for her wonderful flowers. It is surely stimulating to see a plant as brilliant in colouring as "Flames", although I would not advocate for a moment that we should have a garden full of them. Such a place would have no peace; it would surely drive its owner mad as a scarlet room is said to drive its inhabitant mad. We need contrast in the garden and clumps of such brilliant flowers look all the brighter if they are allowed to concentrate the light on themselves, surrounded by duller greens.

Homoglossum is allied to the Gladiolus, a member of the Iridaceae, and has a corm, globose and clothed in a rather coarse brown sheath. The flower spikes are about eighteen inches in height and there are usually two to four flowers on each spike. These have a long perianth tube from which the flower

opens round and red, about an inch in diameter. Their colour is a most unusual flame, and Doctor Marloth says that this is "due to a combination of two pigments in the cells of the epidermis, viz., the red sap and a layer of yellow granules, the latter situated at the base of the petals". The structure is similar to that of *Disa uniflora*, the finest of the Cape terrestrial orchids. This combination of colours gives the flickering effect of flames as the light changes. It is well reproduced in a coloured plate in Doctor Bolus's *A recent book of South African flowers*, a work with many coloured plates issued by the South African Wild Flower Protection Society.

Among the Gladioli, there is an enormous number of dainty and graceful species in South Africa, which are not in general cultivation in England. They have not the massive show of the big hybrids, but their charm and delicate colouring should appeal to all those who prefer the species to the hybrid, and there are many such to-day in revolt against the gigantic monstrosities that have been produced in Dahlia and Chrysanthemum, formless and graceless for the most part. The Gladiolus species are ideal plants for the cool greenhouse or even the Alpine House, as long as they can be well baked and dried off in the summer after flowering.

Gladiolus nanus and its white form, Blushing Bride, and also Gladiolus *Colvillei*, do well with us out in the open. They are planted in autumn and

flower in June–July. They are not heavy and massive, dowager-like, as are the big hybrid Gladioli of florists, but dainty and graceful, about eighteen inches to two feet in height, bending slightly forwards.

Gladiolus tristis is another delightful plant, an exquisitely melancholy flower with soft tones of brown, yellow and green, drooping in hot sun. I have no experience of growing it outside, but I think it probably should succeed in warm borders, although in South Africa it grows in swampy ground and is called "Yellow Marsh Afrikander".

There are two other Cape bulbs which I would like to see grown much more abundantly than at present. One is *Schizostylis coccinea*, the Kaffir lily. The other is *Moraea glaucopis*, the Peacock Iris. This latter is sometimes called *Iris pavonia*.

The Kaffir lily is quite hardy in most parts of the country and flowers very late in the season like *Sternbergia*. Often the plants are in flower as late as November, and they do not begin flowering till the middle of September. The flowers are crimson, glowing and round, six or eight on a slender stem, which nearly always curves gracefully towards the top. They are excellent as cut flowers and last well in water.

Recently an enlarged version of the scarlet *Schizostylis* has been introduced and shown, and received an award under the name of *Schizostylis coccinea grandiflora*. There is also a pink form called

Mrs. Heggarty. I regret that I do not know who Mrs. Heggarty was. The name *Schizostylis* means flower with the divided style.

The Moraeas are Iridaceous plants growing from corms. They are often confused with true Irises, but the flowers are flatter and the standards much smaller. They are frequently seen in catalogues, but much less frequently in gardens, yet to my mind they are some of the most lovely of the Cape bulbs.

The Peacock name is given from the eye at the centre of the flower, formed from a blotch at the base of each petal, generally most intense towards the inside and darkening outside, like the peacock. *Moraea glaucopis* (often listed as *Iris pavonia*) has white petals at the base of which is this brilliant peacock blue-green eye of colour. It is difficult to say whether it should be called blue or green. In one light it is clearly blue, in another clearly green; in many it is a mixture, gleaming like the most brilliant silk or butterfly's wing.

An equally exciting plant and probably also an easier plant to grow, is *Moraea villosa*. This is one of those ever-sporting, ever-variable plants like the Gerberas, and few are exactly similar. The commonest forms have pale mauve outer petals with the peacock blue-green eye at the base. There is often a small orange ring round the three central petals which are much reduced. A rarer form has pure white outer petals. There are also numerous hybrids between this plant and *Moraea pavonia*.

At the Cape these Moraeas flower in September, but in the open in England they generally flower in April or May. If pampered under glass they may flower in March. The true *Moraea pavonia* has brilliant orange petals, but is rarely seen in England. The South Africans call them "Little Owls". Their name Moraea commemorates a Swedish physician, whose daughter married Linnaeus.

Ixia viridiflora is another plant with this strange and fascinating blue-green colouring. It is not peacock blue, but a lighter colour, almost the luminous colour of the base of the sky at sunset on a clear evening when the reds and orange fade into a pale blue-green, luminous and seemingly stretching on for ever.

There are very few plants with this colour; another is *Delphinium macrocentrum*, which I found growing high up on the Equatorial mountains of East Africa, on the Aberdares and Mount Kenya, and which in a warm November is just coming into flower for me in Surrey. Another is Clarence Elliott's wonderful *Puya alpestris*. Ixia is said to be of Greek origin and means bird lime, referring to the juice of the stems.

This green-flowered Ixia is the largest of the genus. Its slender stems may reach two or two-and-a-half feet with a spike of flowers a foot or more in length. The flowers are star-shaped and have a dark centre. Like all Ixias, the stem is slender, grass-like, and sways gracefully in the wind. This Ixia

is obtainable from some English and Dutch bulb growers, and is well worth a place in a collection of choice bulbs.

Ixias are not difficult to grow, and I find the ordinary mixed hybrids do well out of doors on a south border, and they are cheap as crocuses. The bulbs seem very small and the first fear is that they will take several years to grow on to flowering size, but this is not so. They are naturally small.

Ixia viridiflora is now a protected species in South Africa, and so is *Ixia columellaris*, its blue flowered relation. I have, however, never seen this latter in flower in England.

Most of these Cape bulbs are winter growers. They do not want great heat. They should be planted in autumn. A narrow border at the foot of a south wall is the best position. If it is raised with a wall at the edge, so much the better, for then it will drain well. Stagnant moisture is the enemy and murderer of Cape bulbs, far more than cold or frost. A light sandy, non-lime soil is most suitable. Some people cover beds of Cape bulbs with leaves and branches in winter. This undoubtedly helps to keep off frost, but it seems to me bad if it becomes a dank, decaying mass over them. A cloche which keeps them dry is more use, albeit more expense and more nuisance.

Another plan is to grow them in pots and plunge them in a cool frame, maybe with some bottom heat for the winter, and bring them into a cool

greenhouse to flower. Dean Herbert did this. Or you may plant them in a raised and well-drained bed in place of the greenhouse staging, below which there is a pipe. This is the method *de luxe*, and to my mind infinitely preferable to a mass of pots, which I dislike. Only then they can't be brought into the house. Mahommed must go to the mountain, but perhaps that is rather good for Mahommed.

Cape bulbs were brought to Europe first by the Dutch in the seventeenth century and from Holland they came to England. One ship brought Nerine to the Channel Islands and it has become established there. *Nerine sarniensis* is called the Guernsey lily, and Sarnia was the old Latin name for the Channel Islands. *Nerine* is named after the sea nymph who cared for the ship which brought the bulbs to the Channel Islands.

The earliest bulbs were brought home by the old Dutch trading companies. On their voyages to the East they all touched at the Cape. There was no Suez Canal then. Up to the middle of the seventeenth century Table Bay remained neutral ground for ships to take on supplies of water and food. The Dutch formed the first settlement there; it was an involuntary settlement due to the wreck of their ship, and lasted five months. They found life there so good and plentiful that on their return they persuaded their company to make a permanent settlement. They planted English oaks and Italian pines there.

Towards the end of the eighteenth century England sent her first plant collector to the Cape. He was Francis Masson and he came from Kew. He made two journeys and sent home to Kew innumerable seeds of heathers and other plants, and bulbs such as *Ixia viridiflora*. Since then there have been so many collectors that some of the rarest species are in danger of extermination, and the Union of South Africa has had to pass stringent laws for their safety, and to draw up a list of protected plants which may not be dug up from the wild.

Gardeners in England should respect these laws and refrain from encouraging friends in South Africa to dig up rare plants for them. They should rather buy them from a cultivated nursery stock. Practically all can now be so bought. But we can all go and see them and enjoy them now and we can bring back seeds. There are fields of Nerines and Arum lilies.

It is possible also that new species may still be discovered, especially in the higher Protectorates such as Basutoland, an interesting high plateau of grass and moorland. Mrs. Helen Milford, who has been there, assures me that there are no trees over four feet in height. I would find it difficult to enjoy such a land for long. I like luxuriance of growth, great trees and forests; but still the high mountains are also necessary and give one a greater sense of freedom and of an absolute quality in the world than can be experienced anywhere else. Only such a

wind, a mental hurricane as well as a physical one, is so stimulating that it leaves the poor city man's mind dumb, although his body may be active. High mountains are too stimulating for those who are unaccustomed to them. We cannot live with them permanently without blunting our susceptibility to them, although for the good both of our souls and our bodies we should try and visit them every year. For life should be rich with Variety and Contrast, tropical jungle and bare mountain top; all that is richest.

VI

THE GIGANTIC PLANTS OF THE EQUATORIAL MOUNTAINS OF EAST AFRICA

THE most exciting and peculiar plants that I have ever seen or indeed ever expect to see, are the giant Lobelias and Senecios of the Equatorial mountains of East Africa. They are plants of such extreme personality and still so little known in England, that I make no apology for devoting a chapter to them in this book, although I have already written about them at greater length in my former book *Mountains of the Moon*.

It is surprising that not a single one of the plants from these mountains is in general cultivation in England to-day, either as a hardy plant or as a greenhouse plant. Coming from altitudes very similar to those at which some of our most successful garden plants have been collected in the Himalayas, we might have expected a different story.

The Equatorial mountains of East Africa include Ruwenzori 16,794 feet, Mt. Elgon 14,172 feet, Mt. Kenya 17,036 feet, the Birunga or Mfumbiro volcanoes (Muhavura 13,483 feet), the Aberdare

mountains (Kinangop 12,845 feet) and Mt. Kilimanjaro 19,313 feet. During a year spent recently in East Africa with an expedition organized for the purpose of studying the flora and fauna of these mountains, I was fortunate enough to visit and ascend to the higher zones of all those mentioned above with the exception of Mt. Kilimanjaro and those of the Mfumbiro volcanoes which are wholly in the Belgian Congo. In this chapter I would, however, like to confine myself for the greater part to Ruwenzori, the "Mountains of the Moon", and Mt. Elgon, an extinct volcano which contains one of the largest craters in the world.

All these mountains stand up like islands from the surrounding warmer plain, islands of peculiar vegetation which would seem to be a relic of a flora formerly much more widely spread. It is a curious fact that many of the genera on these mountains, and even a few of the actual species, are similar to those found in England. High up on Ruwenzori we found a white Sanicle similar to that found in many English woods, while on Elgon there was a little Violet very like our wild English Violet, though without any scent. The same curious affinities were observed in the insects, particularly the insects associated with the giant plants. Both plants and insects are totally different from those found in all other parts of Africa, with the exception of some of the higher parts of Abyssinia. There we saw groundsels, swollen and distorted with woody trunks twenty

feet in height, Lobelias like gigantic blue and green obelisks, heathers mighty as great trees. Most alpine plants are reduced to extreme dwarfness, but these have rushed to the opposite extreme and exhibit an exaggerated gigantism.

A grey mist made a fitting background for the most monstrous and unearthly landscape that I have ever seen. Vague outlines of peaks and precipices towered around us. Here were plants which seemed more like ghosts of past ages than ordinary trees and herbs. They appeared as a weird and terrible dream to me, a botanist and hunter of strange plants. It all seemed unreal, like some imaginary reconstruction of life in a long past geological age, or even upon another planet. Our own familiar common herbs seemed to have gone mad. Although not lunar in fact, they well lived up to that name in appearance. On the ground grew a thick carpet of mosses. Some very brilliant yellow, others deep crimson in colour. Every shade of green was represented. The tree trunks were also clothed in thick moss, often tussocked into the semblance of faces, while from their branches dangled long streamers of a pale, sulphurous yellow lichen, the old man's beard. Here the silence was the voice. It is good to be able to escape sometimes from the ordinary world; this strange mountain carried us into a dreamland which was often a fairyland, occasionally a nightmare. We were standing almost on the Equator, yet it was as cold as a really cold winter's day in England, and a

little ahead there was permanent snow and ice.

It seems probable that in former geological ages there were periods in which central Africa was very much colder and wetter than it is at present, and that the lakes extended over far greater areas. In such a climate types of plants and animals which now inhabit the temperate, and even the sub-arctic regions, could live comfortably right on the Equator in a land which is now much too warm and dry for them. Then the glaciation in the north retreated. The icecaps on the African mountains also decreased, and in some cases, for example Mt. Elgon, they actually disappeared, maybe at the same time as the Ice Age in Europe retreated, maybe later. As the icecaps retreated up the mountains we may assume that the cold-loving plants followed them until they reached their present positions. The mountain floras do not to-day really begin till a height of 7,000 feet is reached. Thus we may assume that the different mountain floras became isolated from one another and evolved separately. Each mountain top is a little garden where evolution may have proceeded uninfluenced by the rest of lower Africa. But allowing that all this is true, and it is difficult to think of any other explanation of these curious floras, we would expect to find fossils allied to present-day mountain plants in the lower lands. None has so far been found, but this cannot be taken as proof that the plants were never there.

The mountains are separated from each other by

a considerable distance, and there is no present bridge by which plants could pass from one to the other. Yet on each mountain there is the same general aspect and zonation of the flora, the same peculiar gigantism in certain genera, although there is variation among the actual species. This present variation would make distribution of the plants by migratory birds unlikely as a factor acting at present. Only one species of giant lobelia is common to all the mountains. This was the lowest and also the largest species that we found, but in Tanganyika, close to the Amani station, there is another species which grows as low as 3,000 feet. I think that it is significant that the greater variation occurs higher up the mountains. Thus these particular plants open up innumerable questions which are still unsolved. How did they get on to these mountains, or did they develop there? What caused their extraordinary gigantism? How fast do they grow, how long do they live, and under what conditions do they now live?

On the origin of the gigantism no one has been able to produce any really satisfactory theory. We can only say that it would appear to be due to the complement of the rather peculiar environmental conditions present—a low temperature, but one that is moderately constant throughout the year, a very high and constant humidity, and a high ultra-violet light intensity due to the altitude and the Equatorial position. But we do not really know. In

England I have found that these plants grow more actively in the winter. Warmth acts as an inhibiting factor. There is nothing in the behaviour of the particular genera Lobelia and Senecio in other parts of the world to adduce an inherent character of gigantism in them, rather the opposite when we think of the little blue Lobelia cultivated in our English gardens.

A road, winding and twisting round every little green hill, curling sometimes almost back on itself, led to Fort Portal and to Ruwenzori, the mountain which had always seemed to me by far the most attractive and romantic in Africa. Along this we drove one morning in December.

Fort Portal is the nearest town to the mountain, and here is situated the famous "Mountains of the Moon" hotel, whose telegraphic address is just "Romance". The mountain was invisible.

After a night spent at Nyakasura, a fine school where they play football, nestling among the foothills of Ruwenzori, we set out along the road which runs from Fort Portal along all the eastern side of Ruwenzori to Katwe, the famous salt lake.

One of the most exciting events of this day was the proud signpost "SLOW DOWN EQUATOR"; on one arm was inscribed "Northern Hemisphere", on the other "Southern Hemisphere". We duly slowed down, but did not actually stop. I have since regretted that we did not stop and photograph so unique a signpost.

As night fell we left the cars, pursuing our journey on foot to one of those delightful little rest-camps which the beneficent local government of Uganda has sprinkled so freely over the country. There was a second one to receive us the next day, and above that only Ruwenzori, except for the lonely and very beautiful farm where Captain Paul Chapman lives surrounded by mountains and within sound of the incessant music of the Nyamgasani river.

We set off from Chapman's highest camp to the accompaniment of a slow, haunting drum, which beat several days and several nights for an old man who had just died. We were told that he had been struck by lightning. What an omen and what a farewell sound! The slow, steady rhythm of Africa, so sure and so unhurrying, yet so passionate.

It was all unknown ground. There was no track. We had to cut a path all the way. We soon got used to the routine. We cut generally for two or three days; then all the porters were massed for moving camp. The next day we started cutting again.

On some of the lower ridges there is bracken. Everywhere, or very nearly everywhere, in the world there is bracken. Here the cutting was easy. Here we found the first giant Lobelia, *L. giberroa*. This is the largest species of all and is the only species common to all the mountains, ranging from 6,500 to 10,000 feet, but not emerging into the alpine zone. It is really a plant of the forest glade and of the forest edge. On Mt. Elgon we found it in the bam-

boo forest at 9,000 feet. Some of the plants were in flower and had reached a height of 29 feet. A more usual height is 15 to 20 feet. The flowers form a dense raceme, often 10 feet in length. Unfortunately they are greenish-white and partially hidden by linear green pendulous bracts which are larger than the flowers.

This species grows fairly easily from seed and has several times been raised in England. It has recently flowered after six years' growth at Kew in the temperate house. Being a plant of the forest it will not stand any frost, even though it may be protected with bracken, but in Surrey we have found it easy to grow in a cool greenhouse, moving the plants outside for the summer, and in three years from seed it has attained a height of five feet. The leaves are very large and form a loose rosette on the top of a lanky stem. They have a prominent purple midrib and purple venation, which give them their chief attraction. Its bulk and its coarseness of growth make this probably the least attractive and interesting of the giant Lobelias from the horticultural viewpoint. It is, however, probably the easiest to grow provided that there is sufficient room to winter it in a cool greenhouse and that it can be given ample space.

These giant species belong to the Rhynchopetalum series of the genus Lobelia and are found on all the East African mountains both in the forest and alpine zones. A full account of the group will

be found in a paper by Miss E. A. Bruce in the *Kew Bulletin*, No. 2, 1934, so I will only give some short notes here from my personal experience of them.

They are so strange to the ordinary conception of Lobelia, that some botanists have suggested placing them in a separate genus and the idea has much to commend it to my mind in spite of the similarity in floral plan and structure with the more familiar Lobelias. There is no plant commonly grown in English gardens with which they can well be compared. In superficial appearance the only comparisons I can think of are the Eremuri or the giant Echiums from Madeira, but these comparisons have no botanical basis.

Curiously enough, there is a certain similarity of outline between the giant Lobelias of these mountains and a species of giant Puya from the Andes. I believe that there is also a close, although again botanically superficial, resemblance in appearance between the giant Senecios of these East African mountains and the giant Espeletias of the Andes. Possibly similar conditions tend to call forth similar forms, although the East African mountains must be much wetter than the Andes.

Soon we emerged from the bracken into the forest. Like all transitions of vegetation on Ruwenzori, it was abrupt. The forest covered all the ridges above 6,500 feet and stretched great tongues down the valleys beside the rivers. It was not such a gloomy place as some forests I have seen. In frequent

patches a Melastomaceous tree with clusters of large pink flowers, flowers not unlike small single roses, interrupted the continuous green. Few could fail to be thrilled by the giant tree ferns and the wild bananas, some of the most graceful and beautiful of plants. Surely foliage is just as important from the point of view of decoration, as flower. These plants gave dignity and distinction to the undergrowth. Although small beside the gigantic specimens of New Zealand, some of the tree ferns were fifteen feet in height. They had enormous fronds emerging from a stem, slender and often charmingly curved, yet so prickly as to repel most painfully any close contact.

The wild bananas bore no fruit, but had hard seed like large rounded beans which germinated freely. This is the only banana, as far as I know, which can be grown from seed. We have them growing in England from this seed, and their leaves quickly grew eight feet high after two years. In fact we had to part with the largest plant and keep the others root restricted, so that their leaves formed a mere comfortable four to five feet in length. One friend brutally described them as the bananas which "have never done anything about it", referring to their absence of edible fruit. If, however, we consider their biological purpose as growing and reproducing, the other bananas with fruit but no seed would rather merit this description. The vast leaves of bright emerald green were edged with pale pink through

which the sunlight penetrated in a translucent glimmer. The midrib also was pink. I know no leaves through which sunlight penetrates more beautifully than those of the banana. Every vein was delineated like the barbs of a fine quill feather or the crests of the waves of the sea. To stand underneath them and look up at the sun provided a real thrill. The leaves were largely untorn, and did not present the tattered appearance of the common banana. Although often ten or more feet in height, the plants were practically trunkless, the leaves arising from a great cradle formed by the old leaf bases, to which age had imparted a deep crimson colour. Beside the small plant presses these leaves indeed presented a botanist's dilemma. We found many such dilemmas on the mountain.

A group of these wild bananas and tree ferns grew beside a delightful little stream, and at the ford the sunlight penetrated and lit up the outstretched fronds of the tree ferns and the big leaves of the wild bananas with peculiar brilliance. At the edge of the stream grew a very beautiful pink balsam. Luckily, all the rivers were low and we were easily able to reach this plant. Its flowers seemed to float on the end of slender red stems like delicate shell-pink butterflies with wings outspread. It was certainly one of the most attractive balsams I have ever seen. This plant I have introduced to England, and in a cool greenhouse it has flowered continuously for a whole year. We hadn't yet reached the zones of

frost, and so the plants here cannot be absolutely hardy in England. The growth everywhere was very luxuriant; the trees were covered with tangled lianas, festooned with streamers of liverworts and tussocked with moss. This was, indeed, a place in which to stand and ponder, one of those rare corners which seem outside the ordinary busy world, a place where the clock stands still and perfect inward peace blends with an outer peace. Such places and moods are rare. This one will be a memory to us for long.

A forest of vast bamboos formed the next zone. Above us the feathery spikes formed arches over our camp, and the tall straight stems helped the feeling that we were in some ancient cathedral. Only a dim and fitful light penetrated. Our camp fires made from dead bamboos flickered like small candles against the overpowering atmosphere of the forest, and a very real forest these bamboos formed. It was a curious green world: the roof was green, the stems of the bamboos were green, the ground was covered with ferns and mosses in innumerable shades of green. Only an occasional dead and leaning bamboo gave a touch of purple or brown. On the bamboo stems were huge purple slugs. There were few exciting plants in this zone, with the exception of the fine scarlet Amaryllid *Choananthus cyrtanthiflorus*, a monotypic genus, peculiar to Ruwenzori. It has pendulous flowers hung like a mop round the top of an eighteen-inch stem. It has flowered in

England and been given an award of merit by the Royal Horticultural Society. There was also a wicked-looking green, white and chocolate Arisaema.

Although we had cleared quite a large space for the camp, before we left the bamboos had arched again over us, so flexible are their stems. Below them our men flitted silently about like shades and shadows from the underworld. There was little sound, only a rustle of the leaflets, a soft murmuring in the wind and an occasional ghostly creaking and cracking as of some spirit laughing at us. This almost enchanted world seemed to have a deadening and depressing effect on the camp. Few men sang or shouted or laughed. They ate their food in silence whispering in muffled tones. Through the forest bats flitted silently—bats in the bamboos.

Gradually the bamboos diminished in size, dwindling from fifty feet to fifteen, until suddenly we emerged into a zone of tree heathers. Imagine a haunted wood composed of ordinary ling heather magnified fifty times; there were trees fifty feet high instead of bushes of one foot, twisted into weird shapes and gnarled so that each resembled a drawing by Arthur Rackham. Out of each trunk glared a face, sometimes benign, more often wicked and bearded with streamers of lichens and mosses.

Looking out between the tree heathers we could see far into the mountain across a wide expanse of ridges and gorges, but there were no signs either of

the lakes or the snowfields which we had hoped to see. It seemed a wild and desolate expanse, in very truth a place where no man lived or would be likely to live. It was not only bare, but mysterious and unearthly. There was no sound. Here the silence became the voice. When grey and misty it seemed to present a challenge to the man who invaded its solitude; the mountain appeared antagonistic to man and tried to frighten him back again with its uncanny aspect, its cold, its dampness, and the rather putrescent smell which arose from the *Mimulopsis*. Even from the highest branches dangled long sulphurous yellow strands of the Usnea lichen, the old man's beard of many travellers, which one of my companions declared reminded him of the hair of Botticelli's angels, an extremely apt comparison in the sunlight. In the mist they resembled nothing so essentially happy, but appeared rather as some melancholy ghosts, not of the animals, but of the vegetable world, the lost souls of a past vegetable glory flapping their branches and stretching out to frighten the wretched man who dared to penetrate such places. It is, indeed, a place of mystery, haunting when these shapes stand out dimly from a background of swirling mists. Among these the stiff spikes of the lobelias barred our path like figures with upright lances. In present-day life such plants seem out of place: they are rather the complement of prehistoric man, or even the giant reptiles and pterodactyls.

When the sun shone, and it frequently did so for us, the aspect of the mountain changed very quickly and immediately became friendly. Everything then smiled at us; the pink and white everlasting flowers opened into a mass of colour, while the most gorgeous little blue sun birds appeared and flitted among the lobelias, poking their long beaks into the blue flowers and climbing with agility round the great spikes. The male is indeed resplendent with glossy metallic feathers of brilliant turquoise and emerald, but the female is a dingy brown. They are the African equivalent of the humming bird.

This heather forest was the zone of the giant Senecios and Lobelias. The sheer exuberance of the growth of the giant groundsels and the lobelias is astounding and thrilling. One rosette of *Lobelia Bequaertii* would be several feet across, and would have several hundred closely-packed leaves, shining purple and radiating from the centre, where a drop of water would be enshrined like a jewel at the heart of the world. When this lobelia flowered it threw up a stiff green obelisk-like spike, six feet high and nearly a foot in diameter, monstrous and bizarre, but very much in keeping with the surroundings. Between the stiff green bracts the deep purple-blue flowers appeared, a good colour, but unfortunately so masked by the bracts that the general effect of the spike was green. The other dominating species was *Lobelia Wollastonii*, named after Dr. A. F. R. Wollaston, who visited the

mountain in 1906. Its spike is a glorious powder-blue. When the sun touches the dewdrops on its blue flowers and grey bracts the whole spike seems touched with a silvery radiance. Against the iridescent sunbirds look like emeralds and sapphires.

Often the plant is twelve to fifteen feet in height and the flower spike is six or eight feet. The bracts are long and woolly, pendulous and densely covered with a greyish-blue pubescence. The flowers emerge between them and are more conspicuous than in most of the other species. The stem is pitted with a decoration of regular diamonds, which makes even the dead plant interesting. It is abundant in the heather forest zone and in the more alpine zone above, extending from 11,000 feet up to 14,200 feet, where the icicles hung on its leaves and the water from the base of the glacier flowed directly on to it. In the Ericetum the soil is an inky-black, waxy, somewhat gravelly peat, which is very acid. It is perpetually damp.

Unfortunately this magnificent plant is not at all vigorous in growth in England and does not appear to be nearly so easy of cultivation as some of the other species mentioned. It is just possible that there may be difficulties connected with mycorrhiza. On Ruwenzori it has often been photographed half covered with snow and with icicles hanging from the tips of its leaves, but Mr. McDouall reports that it is not hardy at Logan, nor have we managed yet to maintain it out of doors in Surrey. Although

LOBELIA SATTIMAE
on the Aberdare mountains, a species very similar to
L. elgonensis and L. Bequaertii

it often grows in very damp places on Ruwenzori it is not a plant of the peat bogs as is *L. Bequaertii*, and a plant tried in my little peat bog here soon died.

I have, however, received some further cuttings from a bigger plant at the Royal Botanic Gardens, Edinburgh, and several of these are rooting and I hope may yet succeed, although I cannot claim that they grow with any great vigour. Perhaps the beautiful silvery-blue spike is destined only to remain a memory with me until I visit the mountain again.

It was just over 12,000 feet when we made our next camp by a small stream right among the lobelias and giant groundsels. Two lobelias formed our door-posts and the tent ropes were tied to giant groundsels. The mosses were thicker here than anywhere else on the mountain. To sit down and rest was like reclining in a feather bed, brilliant not only with greens, but also with orange and crimson.

Above us the valley broadened out, forming a most delightful garden, full of flowers, framed with steep ridges on three sides.

My companion Stuart Somerville, the artist, called the valley "Paradise Valley". It was walled like a natural garden, with grey hills covered with everlasting flowers, heathers and tree groundsels. It seemed different from the other parts of the valley. A fairy-like but very kindly spirit seemed to pervade it as the little blue sunbirds flitted in the sunlight. They were more numerous here than

anywhere else on the mountain, and the air was full of their twittering-tweeting. Everywhere there were flowers, bushes of white and pink everlasting, powdery-blue lobelia spikes, the purple of the *Lobelia Bequaertii*, and the golden of the tree groundsels, yet it was an orderly, not a tangled riot as on the rest of the mountain. It was like a place imagined in dreams. We were very happy as we rested there before breasting the steep slope up to the pass. Around us the porters shed their loads and rolled about in the grass and heather, chatting easily. These rests on the mountain march were some of our pleasantest times. By now they found little suitable material for smoking, and were delighted with the cigarettes which we distributed. When everyone had smoked a bit, the Nyampara and I would go round rousing them, "Kwenda, Kwenda, tugende", lifting the loads back on to their heads.

I saw my first giant Senecio on Mt. Elgon, but they are very similar in general appearance on both mountains. All the way from England I had wondered about these plants. The reality, however, surpassed my expectation. There he stood at a twist of the path, where it descended into a dip to cross a small stream by a rickety bridge; a veritable tree over twenty feet high, branched, gaunt, and with a certain pathetic, bizarre and indescribable look of unreality as of an old man, transported from another planet or age and set down to confront the present world. "Senex", indeed, means an old man,

and these trees are veritable "Old Men of the Mountains".

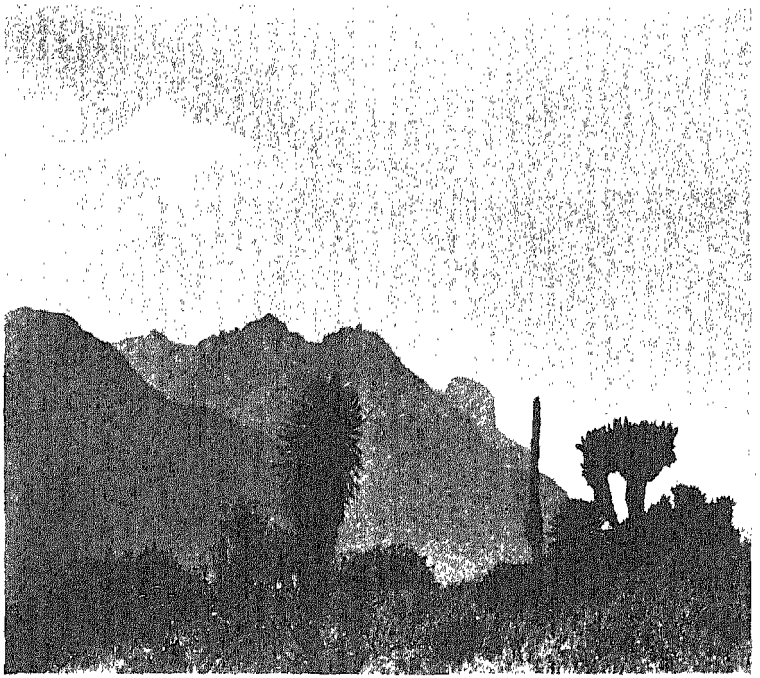
The trunks are twisted and contorted often into all manner of weird shapes, so that some become almost more animal than vegetable; they are surmounted by mops of foliage, like great lax cabbages. The leaves are very large, sometimes three feet in length, and of a rather fierce shade of metallic green. The old leaves do not fall, but remain attached to the tree, dangling as a dead, slowly-decaying mass around the trunk below the rosette. Sometimes they are so numerous that the whole trunk becomes a pillar of dead leaves with a central core.

At Bulambuli there was none in flower, but higher up in the alpine moorland zone we found the giant groundsels flowering frantically. From the centre of the cabbage crown would emerge a vast spike, sometimes three or four feet high and branching repeatedly. The flowers of the higher species were very similar to those of the common English groundsel, except for size and number, but those of the lower species were always much more ornamental having long ray florets (petals to the non-botanist) like the ragwort or yellow garden daisy. Some of these flowers would be an inch and a half in diameter, and one spike would bear a hundred or more, so that the effect was very striking.

At first the sight of the giant groundsels dominated us, and their bizarreness seemed an ever-exciting and thrilling wonder, but after a few days

we began to accept them as part of the landscape, to expect their presence rather than their absence. Even so soon does habit dull over the sense of wonder. On each mountain they were slightly different in appearance and each time thrilled us anew when we came upon them after an interval in the plains. There are no canaries on the African mountain, the more the pity. These giant groundsels would feed all the canaries in the world for a time approaching all eternity, but I suspect that they would be pretty tough and would give our poor canaries a bad tummy-ache. Rabbits might cope with the leaves, but would be unable to touch them growing, owing to the trunk. Still, there are no rabbits on the African mountains, although there are a few hares. In fact, there are very few large animals.

With the Lobelias these Senecios form the most striking element in the flora of the higher zones of the Equatorial mountains. They are, however, probably less suitable for cultivation in this country, owing to the long gaunt woody stems which most species form, and their growth in England seems much less hardy and vigorous than the Lobelias. Mr. McDouall reports from Logan that they are delicate with him when young but appear to get hardy when large. In the higher species the leaves are covered with a dense white tomentum on the under surface, like a silvery fur coat. *Senecio Gardneri* from Mt. Elgon 13,000, is a fine example of this.



LOBELIA WOLLASTONII AND SENECIOS
at 13,000′ on Ruwenzori

For horticultural purposes I think that the dwarf *S. brassica* from Mt. Kenya or *S. brassicaeformis*, a somewhat similar species from the Aberdare mountains, would be the most valuable. These plants do not form long woody trunks and the rosettes are almost sessile on the ground. The leaves are packed closely together and in *S. brassica* are thickly covered with a close silvery-white indumentem. The flowering spike rises to a height of four or five feet, the ray florets are moderately long and all the stem of the spike and the peduncles are covered with the thick silvery-white hair. For some time we had several plants of this species growing quite vigorously here in Surrey, but unfortunately they have now all died. *S. brassica*, like most of the arborescent Senecios, is a water-loving plant and is found chiefly in boggy places from 11,000 to 14,500 feet. Another rather dwarf and very attractive species is *S. alticola* from the Virunga mountains, but this does not possess long ray florets like *S. brassica*.

The Lobelias from Mt. Elgon have also proved easier of cultivation than those of Ruwenzori. *Lobelia elgonensis* I still have with me, growing strongly again although it was very badly damaged by the very severe winter we have just had (1938–9). At one time the rosettes looked completely dead and limp and I despaired of them. However, they sprouted again out of the middle when the spring came. *L. elgonensis* is very similar indeed to *L. Bequaertii* of Ruwenzori, both in flower and

appearance, a stiff green obelisk. I was much excited when I first discovered it and gathered a whole plant under my arm like a great baby and with it marched proudly back to camp. It proved a heavy burden. It was, of course, impossible to press such a monster whole, so he was cut into thin longitudinal slices.

All these species of Lobelia grew in damp places, some actually in bogs and on the banks of streams, but we found on Mt. Elgon one species which grew among rocks in drier places right up to 14,000 feet. This was *Lobelia Telekii*. It has long hairy bracts, drooping and covering the pale-blue flowers, which give it the appearance of a gigantic woolly caterpillar petrified and stood on end. It belongs to the same group as *Lobelia Wollastonii*, but it is not nearly such a fine plant. It appears to be, however, one of the hardiest and easiest of cultivation in English gardens.

The genus Impatiens (balsams) is well represented on these mountains and several of the species are very fine plants indeed. Perhaps the finest of all is the big white *Impatiens elegantissima* from the lower zones of Mt. Elgon. This plant often grows to a height of six or seven feet and produces large white flowers, streaked with deep crimson in the centre and floating on the ends of long petioles like great white butterflies or like the great *Phalaenopsis grandiflora*, one of the finest Orchid species of the Philippines and East Indies. The flowers are often over two

inches wide, while the spur may be three or four inches in length. This species forms underground tubers like the Dahlia and it is possible that in England it might be treated satisfactorily in the same way. In our cool greenhouse in Surrey it has made considerable growth, and has flowered. Mr. McDouall reports that it is hardy at Logan.

In the evergreen forest and in the bamboo zone of Ruwenzori grows a very fine shell-pink Impatiens with flowers often one and a half to two inches across, although not so large as the white *I. elegantissima*. It has the same "butterfly" form of flower with wide wing-like lateral petals. This plant has grown satisfactorily in a cool greenhouse in Surrey and has flowered almost continuously for the past year, even throughout the winter. The flowers are rather variable in size and colour, but the best of them make it, in my opinion, a very fine plant. The stems, which reach a height of three and a half to four feet, are deep crimson. Unfortunately it is not hardy, although it seems happy out of doors during the summer in a slightly shady position.

Both dwarf, creeping Hypericums with little flowers and shrubby, almost tree-like Hypericums with large flowers, are found on these mountains. It is the latter which I would like to see introduced into English gardens. In the commonest species, *Hypericum lanceolatum* from Mt. Elgon, the flowers are about the same size as those of the commonly grown *H. calycinum*, the stigma and ovary is a

handsome crimson, while the flowers are borne abundantly and the plant grows to the size of a small tree, often twenty or more feet in height. The foliage is evergreen and very similar to that of the commonly cultivated white Veronica. But in my opinion the finest Hypericum of all, the finest Hypericum I have seen anywhere, is *H. Bequaertii* from the heather forests of Ruwenzori. This plant also attains the size of a small tree and bears its flowers pendent at the ends of short branches. Unlike the other members of the genus these do not open flat, but are cup-shaped like small tulips hanging from the branches. The outer petals are deep orange. Unfortunately this species has not so far proved very vigorous with us, but it is in cultivation. Dr. Noel Humphreys tells me that he has a plant five feet six inches high in Cornwall, but that it has not yet flowered.

There are several species of Kniphofia on these mountains and although none of them is as showy as the commonly cultivated hybrids, many of them are attractive plants and well worth cultivation. One of them, *Kniphofia Snowdenii* from Mt. Elgon, is in cultivation in England and is now to be found in a few nurserymen's catalogues. It seems to be generally hardy. The flowers are yellow and are borne in a loose raceme, two or three feet in height. The plant somewhat resembles a giant Lachenalia.

Epiphytes did not for the most part prove interesting here and the epiphytic orchids were ex-

tremely dowdy, being far eclipsed by the terrestrial species. There was, however, one epiphyte which greatly attracted me, *Canarina Eminii*.

The genus Canarina belongs to the order Campanulaceae and only one species, *Canarina campanulata* from the Canary Islands, is at present generally cultivated in this country. *C. Eminii* grows as an epiphyte on Mt. Elgon, between six thousand and nine thousand feet. The branches and leaves are glaucous and pendulous. At the ends are large pale orange bell-shaped flowers lined with deep crimson. Inside the bell is a large club-shaped stigma like a clapper. This plant is easily cultivated in a cool greenhouse in this country and forms a permanent fleshy tuberous root. After flowering it quickly dies down and we dry it off like a Dahlia tuber and start it into growth early the next spring. *C. Eminii* has a naturally graceful habit of growth, which combines with the beautiful flowers and the ease of cultivation to make it a valuable plant. During the summer it can be planted outside. It grows easily from seed.*

A second species of Canarina from Mt. Elgon has recently been sent to me from the Mt. Elgon Nurseries. It appears quite distinct in growth and flower from *C. Eminii*, the flowers being deep orange outside. They are very attractive although not so large as those of *C. Eminii*. It is probably *Canarina abyssinica*.

* The Royal Horticultural Society awarded this plant an "award of merit" when I showed it at the Chelsea show 1938.

Epiphytic Orchids are not very plentiful on these mountains and we found none of possible horticultural value. Terrestrial Orchids are common and several are attractive. The finest is perhaps *Disa Stairsii*, which has a fine deep pink spike and is common on all the mountains in boggy places. Unfortunately it is not easy of cultivation in this country.

There are several umbellifers which we thought attractive, in particular *Peucedanum Kerstenii*, an almost arborescent species from the heather forests of Ruwenzori with very fern-like foliage, and *Heracleum elgonense* with creamy flowers from the higher zone of Mt. Elgon. Mr. McDouall had *Peucedanum Kerstenii* growing at Logan but reports that it was not a success.

There are no Gentians on these mountains but the large-flowered dwarf white Swertia, which we found on the Aberdares, seemed to me a most attractive plant and I regret that I have not got it growing here. *Delphinium macrocentron*, with its gorgeous electric-blue flowers, is another plant which I would like to be able to grow, but I have not, so far, been successful. From Ruwenzori the rampant creeper Thunbergianthus would be desirable for the large cool greenhouse or the orangery, but none of the seeds we collected has germinated and other attempts to introduce it have failed. There is also a large golden-flowered Sedum, about eleven thousand feet, on Ruwenzori, which I would like to have been able to introduce. Near the foot

of several of the mountains we also found plants such as *Gloriosa superba* and *G. virescens* and *Haemanthus multiflorus*, but these are not elements in the mountain flora and are known in this country.

Although the chief plants of these mountains are by now known, I am sure that there are many which could be profitably introduced into English gardens. There is a possibility also that the second and third generations raised from seed entirely grown in England might prove more hardy and better adapted to English conditions than the first generation.

Plant collecting suggests a pleasant, lazy occupation. In fact it is just the opposite. In new areas it is necessary to cover as much ground as possible so as to gather a representative collection of all the plants over all the different zones and associations. In a general collection such as ours, all the plants had to be gathered, not only those with showy flowers, as many collectors delight to do. Often the duller specimens turn out to be the least known and most interesting when they reach the herbarium. After gathering, each plant must be put either between paper or into a tin box, so as to keep it from wilting. It is impossible to make a satisfactory specimen from a plant which has begun to wilt or shrivel up. Several specimens of each plant are required, so that they may be distributed among different herbaria. In camp each piece must be carefully laid out between paper so as to make a well-shaped specimen. All this makes a very considerable difference

to the man who eventually names the specimens. It is very difficult sometimes to identify with any certainty specimens where there is only a fragment of the plant, or where it is very shrivelled. On each specimen a label must be tied with a number, and this number must correspond with the number under which the field notes are written in the book. These should be as full as possible. Details as to place collected, altitude, date, size of plant, colour of flower and whether it is very common or rare are all desirable. Some collectors do not even mention whether their specimens come from a tree or a small herb a few inches high. Though often it is apparent from the specimens, it is not always so.

VII

FIERCE WONDERS FROM CHILE

ONE OF the most exciting introductions of recent years has been that of *Puya alpestris*, which Clarence Elliott found growing among the hills outside Concepcion in Chile, south of Valparaiso. John Nash's magnificent drawing has been made from the actual plant exhibited by Mr. Elliott at the Chelsea Flower Show in 1936. Rightly it caused a horticultural sensation. Out of a pineapple-like rosette of prickly leaves, pleasantly recurved and covered with a white farine below, emerges the monstrous spike about three to four feet in height. The flowers are a most subtle shade of blue-green, villainous and evil in some lights, but yet indescribably fascinating. They have a silky, satin-like texture to the three petals which surround the brilliant orange anthers. In the centre is a lettuce-green stigma, tufted and velvety. Each flower is about three-quarters of an inch in diameter, funnel shaped and nearly two inches long. Clarence Elliott informs me that it remains in flower for four to five weeks.

I have only seen one flower which could compare with Puya in colour, and that is *Delphinium macro-*

centrum from the Equatorial mountains of East Africa and that has not so far developed its strange colour in England, although it can be flowered without difficulty. The back shield of some beetles and the wings of tropical butterflies sometimes also get near to this wonderful colour.

The flowers of Puya are borne in small clusters towards the base of long spiky side pieces. These look like bird perches, and I have been told that they actually serve as bird perches since the plant is pollinated by humming birds. What a wonderful combination that must make. The flower is brimming full of nectar and the humming birds suck this. It even spills when the plant is shaken.

Clarence Elliot tells me that he only found one small colony of *Puya alpestris*, a dozen or so plants, growing on a hillside in full sun. With difficulty he collected some half-dozen rosettes with roots, portions of clumps, which he carried about on his travels for three months, nasty prickly travelling companions. I think the award was a fitting tribute both to the toughness of the plant and the collector. It was one of those plants which flowered after seven years, just in time for the Chelsea show. I understand that the first flowers came out only on the Saturday before the show opened. No seed germinated from the original collecting, where it was a little green and from the imported plants only a few capsules set seed where the flowers from the two plants had been carefully cross-pollinated.

PUYA ALPESTRIS

None of the flowers pollinated with pollen from other flowers on the same plant set any seed.

At first *Puya alpestris* was thought only to be a pigmy variety of the great *Puya coerulea*, which has been known for many years, but which has never proved a very useful plant for cultivation owing to its size. It is not hardy except in Cornwall and would be rather like having an elephant in the greenhouse. The leaf rosettes are said to be four to five feet across and they cluster into clumps twenty to thirty feet across, while the flower spike is twelve to fifteen feet in height. I have never seen this giant in flower, but it must be a wonderful sight. Clarence Elliott writes that it is abundant in the same area as that in which he found his attractive Leucocoryne.

However, *Puya alpestris* really belongs to a slightly different section of the genus since it has the bird perches projecting beyond the flowers, elongated and composed of short branches with many sterile bracts, while in *Puya coerulea* these branches bear fertile flowers right to the apex.

Engler puts the two genera into separate subgenera, *Puya alpestris* into the subgenus Eupuya and *P. coerulea* into the subgenus Pitcairnopsis. *Puya alpestris* seems to be very much closer to *Puya Whytei*, which has been grown for some time in the Scilly Islands and other very mild places. There is a picture of it in Mr. H. H. Thomas's gardening encyclopædia. These have reached a height of ten feet or more and must have borne several hundred flowers.

This plant is undoubtedly different in size from Clarence Elliott's plant, although Engler does include *Puya Whytei* under the species *P. alpestris*.

This is not a completely new discovery. It was first described under the name *Pourretia alpestris* from a plant collected by Edward Poeppig in the book of new genera and species published by him and Endlicher in 1838, as a result of his South American journeys. *Puya Whytei* is also featured by a very fine plate in the *Botanical Magazine* for 1868 from a plant flowered at Kew and described as a "superb rock plant, introduced by Messrs. Veitch from Chile, through Mark Whyte, an enthusiastic amateur, in whose honour as discoverer it is named". It is also recorded that this plant had proved hardy through the winter of 1867 and flowered in the open air. The peduncle was three feet high, stout and erect, which corresponds well with the size of Mr. Elliott's *Puya alpestris*. Another closely-allied plant is *Puya penduliflora*, but I have never seen this plant in cultivation. The flowers are also reported to be blue-green in colour.

Puya alpestris can be grown easily in a cool greenhouse and seems to take kindly to pot culture. It should not be watered excessively, in fact, treated like a succulent or Cactus. Clarence Elliott assures us that it can be grown on a sunny window ledge, and I see no reason against that. It is at present too valuable to experiment with, although there is a chance that it might survive mild winters outside if

kept dry with a cloche. Clarence Elliott writes that it probably gets a little frost in Chile, but that is little criterion of what it will stand here, a fact which I have found to my cost over the giant Lobelias from the East African Equatorial mountains which I have endeavoured to raise.

In rosette alone it is most decorative. I have one small plant, a seedling, I believe, from the famous plant, and I have found that it grows easily and fairly fast. My plant has not, however, yet reached flowering size.

Undoubtedly *Puya alpestris* has that strange indefinable character which we call Personality. It is not a plant which anyone could quickly forget.

Another very exciting species is *Puya chilensis*, which bears greenish-yellow flowers and has been featured in the *Botanical Magazine*. It is reported that it was cultivated and flourished in the cool stove-house at Kew. It had a stem of four feet and above that a great rosette of very spinous leaves from which emerged a flowering stalk four and a half feet high, with masses of yellow flowers, funnel-shaped and about two inches in length, that is slightly larger than those of *Puya alpestris*. There is just a hint of green in the yellow as there is in the blue of Clarence Elliott's plant, but probably this only serves to increase the attraction. Whether it would be a very manageable plant in a small greenhouse, however, is another matter and one on which I would not like to pronounce an opinion. The *Botan-*

ical Magazine suggests that it would be magnificent for fences since the upper half of the leaves has all the spines directed forward towards the apex, while those lower down the leaf are curved backwards and downwards, and are even larger and stronger. In Chile, where I gather it is not a rare plant, the spines are used for fish-hooks.

I imagine that this is also the same plant that Poeppig discovered and describes under the name *Pourretia coarctata* in these terms: "De planta hacce memorabili cujus caules squamis horrentes per terram longeprostrati serpentibus giganteis comparantur." I don't think that "serpentibus giganteis" requires any translation.

There is also *Puya Raimondii* of which I have only seen a photograph. It has the outline of *Lobelia Wollastonii*, an enormous torch spearing into the heavens. It is apparently a gigantic plant, ten metres high and grows on the Peru Cordilleras. The flowers are small, yellow and partly hidden by bracts. It is, however, for its form that it is outstanding.

Chile has also given us another of the finest blue plants in cultivation *Tecophilaea cyanocrocus*, the Chilean crocus. It was named by the botanist Bertero after Tecophila, daughter of Colla, a Piedmontese botanist of the early nineteenth century. Even so do plants acquire names quite foreign to them and their original habitat. It is not, to my mind, a good custom, although doubtless a graceful compliment which was well appreciated at the time.

Tecophilaea has a small tunicated corm like a crocus and is reported to grow on the Chilean Andes around 10,000 feet between Santiago and Valparaiso. On its native mountains it is apparently very rare now and often its leaves and flowers are eaten by cattle. It has a very short growing period, just while the snow is melting. Afterwards it is bone dry and later when the snow returns, it is kept dry and dormant again like plants in the Alps. Unfortunately it has not proved very easy in cultivation in England, and, although often listed, its price remains high. I myself can give no special tips for its cultivation since my only attempt was unsuccessful. The flower though, is most lovely and I intend to make another attempt. It is a real deep gentian blue in colour, yet with a tinge of paler sky in it and with a faint white venation on the petals, suffusing to a stronger white towards the throat. I know of no other flower outside the gentians which has this colour. The flowers are superficially shaped like those of a Crocus and about the size of one of the larger Crocus species although not rivalling the garden varieties. However, they open much wider, so that they are almost campanulate, the petals being gracefully curved, not opened flat as do some Crocus species. In this country it flowers during February and March. Col. C. H. Grey describes it as the most lovely of all hardy spring bulbs.

Chile is also famous for the brilliant scarlet and blood-red flowers which it has introduced to our

gardens, *Embothrium coccineum*, *Tropaeolum speciosum*, *Tricuspidaria dependens* and as a milder colour *Lapageria rosea*. These are not, however, inhabitants of the dry hills by the coast as Puya, but of the damper forests on the slopes of the Andes, where mountain air meets with moisture-laden air from over the Pacific, or so we suppose. For that reason all these plants do better in gardens in the milder parts of England, especially in the West, where there is usually more moisture in the atmosphere. From the same zones come the Eucryphias and that magnificent climber *Mutisia decurrens*. However, this very spring I have seen Embothrium flowering in the open in two gardens around London, one in Surrey, the other in Essex. In neither case was it in a specially warm or extra well-sheltered position. I have been much encouraged by this since there is a tendency to suggest that Embothrium can only be grown satisfactorily in Cornwall or Ireland or the West of Scotland.

Embothrium is a Proteaceous shrub and is often called the Chilean Fire-bush, so brilliant are the flowers. They are both rich and brilliant in colour, not merely dazzling and war-like, as is the scarlet geranium or salvia. They are almost unique in colour, probably one of the most brilliant flowers in the world. The flowers are long and tubular and are aggregated together into heads not unlike pincushions stuck with scarlet-headed pins. Each flower bud has a slight swelling at the apex like the head of

a pin. The leaves are thick and leathery. Recently a new species, *Embothrium longifolium*, has been brought back from Chile by Mr. Comber, and it is claimed that this is hardier than the former species. In appearance there is very little difference between the two species.

The crimson *Tricuspidaria lanceolata* is a most valuable and exciting shrub in mild districts since in May it should be covered with deep-red lanterns hanging on long stalks. Each lantern is about an inch in length and about half an inch in diameter. If it is seen with the sunlight shining through it, the lanterns appear lit up as if each one carried inside a little light. The foliage is a rich dark-green and shows off the deep-crimson flowers to great advantage. A synonym for this plant, which has survived long and persistently, is *Crinodendron Hookerianum*. It was first introduced by William Lobb, one of the Veitch collectors, who found it in the province of Valdivia in Chile.

There is also a white-flowered species, *Tricuspidaria dependens*, flowering in August, but it is reputed to be less hardy than the red species and is certainly very much rarer.

Both Tricuspidaria and Embothrium like peaty acid positions, a moist atmosphere and probably a little shade. They are seen at their best in Irish and Cornish gardens and in the West of Scotland, but I have seen Tricuspidaria flowering satisfactorily on a sheltered wall in Surrey.

All over Scotland, on nearly every little cottage in the Highlands, we see a most brilliant scarlet-flowered creeper with masses of little flowers, fine fern-like foliage and slender hair stems. This is a Nasturtium, *Tropaeolum speciosum*, and it also comes from Chile, although it has almost established itself now as a native in Scotland, and after heather is one of their commonest plants. It is often called the Scotch flame-flower. It makes long fleshy tubers and dies down into the tubers every year, yet during the summer it will often make thirty or more feet of growth. Originally it was discovered by Poeppig, who also first found *Puya alpestris*, in the Sub-Andean region of Southern Chile.

The flame-flower is particularly fine clambering over a dark yew hedge and its roots like the coolness of the north side of a yew hedge. The dark-green yew, almost black in the shadow, makes a splendid foil for the flaming scarlet flowers which glow and gleam in the sunlight. The foliage is often lost in the hedge and from a distance it seems as if the yew had produced some strange growth or flowered in a new childhood or Indian summer, a lurid burst of scarlet frenzy. However, in reality the yew remains as sober as ever; it is merely garlanded adventitiously with the Tropaeolum, yet I do not think that any harm is done to the yew. The Scotch flame-flower, however, presents a mystery, which has, so far as I know, still proved insoluble. All over Scotland it grows as a weed, yet in the greater part of England

and in many otherwise excellent gardens it won't grow at all. In a few gardens on the South and East Coasts and around London it will just grow and produce, as a triumph for its owner, a few flowers, but there is nothing like the Scotch luxuriance. At Wisley I have recently seen it doing really quite decently by Southern, although hardly by Scotch, standards. Messrs. Woolworth have sold the tubers in small packets in their shops all round London, yet it still seems as rare and as romantic as ever.

Among Composites the climbing habit is rare, while among climbers brilliant orange flowers are unusual. So *Mutisia decurrens* is remarkable in two ways. It is also remarkable for its rich glowing colour and for its striking personality. It was introduced through Richard Pearce, one of the Veitch collectors, from the Chilean Andes and first flowered in this country in 1861, but it still remains a rare plant. It is evergreen, and scrambles rather than climbs, clinging with tendrils to any supports. In consequence it is probably best planted where it can grow through some other shrub, and it seems to benefit also from having its roots in shade. The most successful plant is at Killerton, near Exeter, where it is reported to have borne over three hundred flowers in one summer. So it cannot be reckoned as an impossible plant by any means. I have also seen it flowering, though to a much lesser degree, just inside the door of the first cool greenhouse at

Wisley. It is doubtful, though, whether it really needs greenhouse cultivation.

The stem is winged and the leaves are rather crinkled and strap-shaped, the midrib prolonged into a tendril. When established it scrambles rapidly, but is rather inclined to leave a long bare length of stem towards the base. The flowers are very large, four to five inches across, solitary on fairly strong stems about four to five inches long. There are generally about fifteen ray florets and each should be half an inch wide, so that they touch each other. The ray florets are the most brilliant orange colour that I know, only rivalled, but I don't think excelled, by the Gazania. The disc is bluish-green.

Mr. Bean recommends *Mutisia Clematis* as the most amenable species. The flowers are orange, almost scarlet, and two and a half inches across, but I do not think that it can compare with the glory of *Mutisia decurrens.*

Mutisia retusa is also moderately amenable to cultivation on a warm wall in counties around London, and produces rather ragged, albeit quite large, pink flowers and curious holly-like foliage. It does not, however, greatly enthuse me.

Another curious and most desirable climber from Chile is *Lapageria rosea*, but this is probably more tender than the Mutisias and around London can probably only be grown satisfactorily in a cool greenhouse.

It was a distinct surprise to me to come on this

MUTISIA DECURRENS

plant for the first time. We were walking through a woodland garden in County Wicklow when we suddenly came on an oak tree around the stem of which was a slender wiry climber with dark-green oval leaves rather leathery and tough, and beautiful pink flowers, pendulous and bell-shaped and stiff as if modelled in wax.

Lapageria belongs to the Liliaceae, and although there are many Liliaceous climbers there are very few of any horticultural interest, and it is not a family which gardeners associate with the climbing habit. Like the other Chilean shrubs just mentioned, Lapageria likes a cool peaty soil and no lime.

Good summer-flowering shrubs are rare, and Chile has undoubtedly provided for us a useful and attractive plant in *Eucryphia pinnatifolia*, which flowers in August. I do not, however, join with the extreme pæan of praise which greeted it in the horticultural Press, ranking it as high as *Meconopsis betonicifolia*. It forms a large bush or even a small tree fairly freely covered in August with white flowers not unlike those of a Gordonia or a Hypericum. There is a large bush of stamens which provides the chief attraction of the flower. Although the flowers are large, two to three inches across, my recollection of them is that they are not of a very clear white.

Also in the Chilean forests is *Desfontainea spinosa*, that shrub which has foliage almost indistinguishable from a holly and then suddenly produces in mid-

summer orange-red pendulous trumpet-shaped flowers, surely a great surprise to everyone who has been deceived in passing it by as a common holly. It is not too hardy, but will grow reasonably in the milder countries.

From Chile also come two of our best garden shrubs, plants so common and so excellent that it is not necessary for me to describe them here: *Buddleia globosa* and *Berberis Darwinii*.

The honey-balls of the Buddleia are just becoming golden now as I write in early June, a fine accompaniment of a glorious sunny day. Few realize how sweet they smell.

We always prune this Buddleia severely after flowering and in this way obtain bushes as thick and wide as they are high. It is unnecessary and, to my mind, not over-beautiful to have tall lanky Buddleias, bare at the base.

The finest *Berberis Darwinii* I ever saw was in Scotland. It was growing up a wall and must have been twenty feet high at least. It was completely covered with flower, brilliant, flaming orange and coral in the sunlight, while the path around was covered with gold dust from the fallen flowers. It was actually discovered by Darwin.

From Chile also comes that most odd of all rock plants, *Calceolaria Darwinii*, from Patagonia at the far south end of the American continent, where the Alpine flora of the Andes comes down to the sea. It is a small plant, a real alpine, but the flowers are

large, borne on three-inch stems and poised like a slipper by the heel. The main part of the slipper is deep golden-orange in colour, and it is flecked and streaked with deep crimson. It is about an inch in length and nearly half an inch in width towards the base where the pouch-like slipper comes forward. The base has a deep crimson-maroon band, while above this is the oddest part of the whole flower—a thick waxy band of pure white across the whole width of the flower, forming the breadth of the pouch. The hood is very small and does not shield from view the central yellow stigma flanked by two large stamens. The two lateral green sepals first appear at the sides of the stamens, adding an extra colour to the already curious combination.

Calceolaria Darwinii is not a fat bloated flower as are the greenhouse Calceolarias. Far from it. It has a personality all its own, a kind of gnome-like charm which no other Calceolaria I know possesses. Although like the Berberis, it was actually discovered by Darwin, it is to Clarence Elliott that we chiefly owe its present presence in English gardens and alpine houses.

But *C. Darwinii* is not a very easy plant. It seems to want a scree mixture with a rather more lavish amount of peat and loam than usual, really good drainage, plenty of moisture during the summer, but little in winter. It flowers in June and a big plant may produce twenty flowers or more. The leaves, I am sorry to say, are definitely dull, even

rather plantain-like on a small scale. Still, they provide an unobtrusive foil to the magnificent flowers. Mrs. Anley tells me that it comes easily from seed, and indeed I have benefited from one of her seedlings which is flowering now.

The nicest of the other Calceolarias, to my mind, is *Calceolaria tenella*, which runs about the rocks and produces little yellow bags, the smallest of any Calceolaria.

There are many other Calceolarias in Chile, both large and small, great climbers, shrubs and little alpines, and I think that it is a genus which might possibly benefit well both from further introductions and from careful interspecific hybridization.

The rosulate Violas are another most exciting phenomenon from Southern Chile, but since I have never seen any I cannot speak to any extent of them. According to the photographs in Dr. Sampson Clay's book, *The Present-day Rock Garden*, they form rosettes not unlike Sempervivums.

VIII

CHILDREN OF THE MEXICAN SUN

FEW realize also how many excellent plants come from Mexico. We tend to associate Mexico only with Cacti and deserts, but there are also water gardens and great mountains, forested and snow-topped. Of bulbs, there are Tigridias, Zephyranthes and the beautiful *Hymenocallis Harrisiana*. Our two best Salvias come from Mexico, *S. patens* and *S. Grahami*, the finest pine of all, in my opinion, *Pinus Montezeumae* from forests on the mountain slopes where also abound orchids, Tillandsias and tree ferns. Of shrubs there are few to rival in brilliance of colouring *Fremontia mexicana*.

The ancient Mexicans, the Aztecs, were great gardeners, and their gardens made an enormous impression on the Conquistadores, that daring band of ruffians, inspired partly by an unquenchable thirst for gold, but also with a bigoted religious zeal and fury which has seldom been equalled. They conquered the great Montezeuma; during his captivity one of the few things he asked for was to be allowed to visit his gardens; it is reported that this was permitted to him.

The Mexican gardens were chiefly formal gardens with enclosed courtyards, patios, coloured tiles and large jars and pots full of plants and little pools and fountains in the middle. Some must have been of great extent, including trees and all kinds of plants. Montezeuma had terraced and hanging gardens, which even may have rivalled those of Babylon.

But as they are children of the sun there is a certain hard and garish brilliance about many of the flowers. Xochitl is the Mexican word for a flower, and to our uninitiated ears that is a hard and difficult, albeit rather seductive, word. The flowers are like that, although luckily they are not particularly hard to grow.

Spain is also a country of brilliant sun, hard and cruel in many aspects, a country of flaunting beauty and great sombreros: Mexico always had that quality, but the Spaniards brought into it a style of gardening which easily melted into the existing styles and Mexican flowers always seem to me rather like the Spaniards.

They displayed interest in them too. As early as 1570 they sent out the famous botanist Dr. Hernandez to study the plants of Mexico and their medical properties. In those days Europe still approached gardening from the viewpoint of medicine, herbs and utility; while the Mexican rulers had developed their gardens for beauty and peace and pleasure, a concept nearer to our present ideas than the doc-

trine of the Middle Ages. In many ways Montezeuma was more civilized than his conquerors, but, alas, throughout history his fate has often overtaken the civilized, when opposed to the frantic boisterousness of the less developed. We are at the same cross-roads to-day; but I don't think our fate will be that of Montezeuma.

Tigridia, the tiger flower from Mexico, is like a beautiful great exotic butterfly, delicately poised on the stem. Yet it is a fierce flower, not unreminiscent of its tiger name. They are gay, flaunting flowers of the sunlight, where the shadows are deep purple. They are also known as shell-flowers, and they have something of the fantastic underwater coral gardens in them too. In the ancient gardens of Mexico they were known to the natives as *el cacomite*, and I read were grown not only for their beauty but also for their definite food value, having the flavour of chestnuts. I suppose that the Mexicans ate the corms. These should be planted in a sunny place in April or May, and quickly the short sword-like leaves will appear, ribbed and pleated all their length. The flowers are made on the triangular pattern as in all other Irids. They are three or four inches in diameter and the three outer petals are pink or crimson or orange. In shades they are infinitely variable. There is even one that is violet, and there is also an albino. Towards their base they are mottled and spotted with deeper colour. The three inner petals are thicker and project slightly

between the outer petals. These are waisted like a figure of eight. They are spotted fiercely with deeper colour than the outer petals, while from their centre projects a long stigma, straight like a trident poised to dart at the onlooker.

Like many other brilliant flowers, they last but a day. That is often the way of such flaunting magnifience. They are more than an ordinary flower. They are an experience, things of warm joy and strong sunlight. The very quality of the sunlight is in them.

In an old traveller's account of the Mexican mountains, I have just read, "Tigridia fringe the edges of ravines, and in damper places make a show like Tulip beds". Could anything be more magnificent?

This old quotation also contains a hint for the cultivator. Although they like sun and seem to be plants of the sun, they don't want to be too dry at the roots.

The Zephyranthes, the flowers of the Western wind, are not very well known in English gardens. From Mexico they stretch northwards into the United States and southwards into Peru. The ordinary white *Zephyranthes candida* is fairly hardy in the South of England, and at Kew it is used as an edging to some of the narrow borders at the foot of the greenhouse. The flowers are shaped like a crocus, only they are borne on stems four or five inches in height. They are unusually pure white in

TIGRIDIAS

colour, and when the cups open they reveal beautiful golden stamens. The foliage is narrow and grass-like, of a deep-rich green and the bulbs divide and multiply very freely indeed. The Zephyranthes are also excellent pot plants for the cool greenhouse. *Zephyranthes rosea* and *Z. carinata* are very similar. Both have delicate pink flowers, rather larger than the white species, not unlike a small Hippeastrum, but entirely lacking in the blatancy and striking effrontery of that flower. They flower in late summer and early autumn, and should be rested before flowering, like a Nerine. There is also a yellow-flowered species, *Z. texana*, but I have not seen it in flower.

Zephyranthes, although natives only of Mexico and the United States, are common in gardens throughout the Tropics, and I obtained my first bulbs of the pink species from a garden in Uganda.

From a similar source I also obtained my beautiful white spider lily, *Hymenocallis Harrisiana*. It is, however, a native of Mexico, and the people call it in some districts "Star of Saint Nicholas". It is a curiously-formed flower. There is a very fine, almost membraneous, white cup which joins together the bases of the stamens, while between the stamens the cup gives off long white streamers, which have earned for it the name of spider flower. It is, however, a delicate flower, a flower of the utmost refinement, a term which cannot strictly be used to describe spiders. It is faintly scented.

Hymenocallis is very closely allied to the genus Pancratium. It is also sometimes known as Ismene. It is not quite hardy, and should be cultivated in pots in a slightly warmed greenhouse and treated like a Hippeastrum.

From the completely tropical coastlands, the mountains of Mexico ascend through sub-tropical and temperate zones to eternal snows. One of their commonest trees is that magnificent Pine, *Pinus Montezeumae*, a really regal tree fittingly named after the King of the great Aztecs. It grows in both the sub-tropical and temperate zones, but in many places above 6,000 feet where the climate almost becomes temperate, it replaces the tree ferns and the oaks as the dominant tree, and is used for timber. It ascends to 13,500 feet, but at this height is much smaller in size. The Mexicans call it Ocote.

In an account of Mexican plants, I read that there are hundreds of orchids on the rough-barked trees —white, purple and crimson, while the open slopes are studded with Salvias, thistles, dahlias, lupins, begonias and oxalis. Fuchsias grow ten feet high. In growth in Mexico this Pine is said to resemble the Scotch Fir, often reaching a height of a hundred feet, but in this country it does not follow that habit. Unfortunately it only does well in the warmer parts of this country, in Devon, and Cornwall, in Ireland and in the West of Scotland. I remember very especially a wonderful specimen in Mr. Walpole's fine garden at Mount Ussher, in County

Wicklow. I have never seen a finer pine tree. I have not its exact dimensions, but from memory I should judge that it was forty or fifty feet high and quite twice that amount in spread. All round the branches swept gracefully down to the ground, ending in great plumes of long, stiff, slightly glaucous needles. It was a most majestic tree. The needles are borne in fascicles of three to eight and sometimes they are as much as forty-five centimetres long, although I myself have never seen them quite so long. They stand round the young buds like a stiff Elizabethan ruff. The buds are large, often bright ochre yellow. The cones are also large, dark brown sometimes as much as twenty-five centimetres long. They are some of the finest cones produced by any pine.

Pinus Montezeumae is a most variable tree, and several different varieties have been named. The variety Hartwegii is one of the hardiest and grows high up in Mexico. It has stiff glaucous needles, a little shorter than the true *P. Montezeumae*. The *Var. Lindleyi* I have always found greatly inferior to the true *P. Montezeumae*, for which it is sometimes supplied. However, I have only seen a few plants. Others may be better. The needles are not glaucous and stiff, but deep green and rather pendulent, although they are not quite so pendulent as are the needles of *Pinus patula*, another excellent Mexican species. Our plant in Surrey of *Pinus Montezumae var. Lindleyi*, obtained in mistake for the true species,

just survives through the winters, but does not make much progress. It is irreverently known as "Monty from Mexico".

There are at least eighteen species of Pine in Mexico, but apart from the two mentioned, only one more, *Pinus Ayachuite*, is found to any extent in English and Irish gardens, and then only in the warmer counties. It has beautiful glaucous needles as blue-grey as any Pine I know, although not quite so strong in colour as the shoots of *Picea pungens var. Kosteriana*, which is almost more blue than grey.

Our two finest garden Salvias also come from Mexico, *Salvia patens* and *Salvia Grahami*. *Salvia patens* is one of the best blue flowers I know. It needs no praise from me to establish it in gardens. It is already established there. *Salvia Grahami* is still rarer. We grow it against a South wall of old brick against which its brilliant scarlet flowers seem to blend well, a curious and interesting combination. Often the whole bush is covered with flowers so that the foliage is hardly visible. Even though it may be cut down to the ground in the winter, the growth is so rapid that a bush four feet high at least may be grown in the year. The flowers are not individually very large, about half an inch in length, but they are borne with such frequency and are so brilliant in colour that they make, during July, August and September, one of the most startling masses of colour in the garden. The leaves are

pleasantly aromatic, almost as strong as mint when crushed.

In Mexico I read that there is an even more brilliant scarlet-flowered species, by name *Salvia sessei*, making bushes fifteen feet in height, but I have never seen it or heard of its cultivation in England. It should be well worth obtaining.

As we go northwards into California and the United States, there are two plants with white satin-like flowers which have always given me much pleasure and which seem to me to contain personality, *Oenothera teraxicifolia*,* the subject of John Nash's drawing, and *Romneya Coulteri*. I was given the Oenothera some years ago by the late Sir Arthur Hort after a visit to his fine garden, and ever since it has been known in the family as a "Hort", an easy way of remembrance for those who find its real name difficult. Its latin name is, however, logical. The leaf is completely like that of a dandelion. In fact, I have to taste them to tell the difference. The dandelion leaf tastes bitter; as far as I can tell, the Oenothera leaf has no strong taste. This curious resemblance is a possible cause of their disappearance from gardens to which we have given plants. They are perfectly easy to grow, requiring treatment like any herbaceous perennial, almost dis-

* I find there is some doubt as to the exact locality from which this Oenothera comes. There is a record of it coming from Chile, also another less certain from Southern United States. That is the home of the majority of the genus.

appearing in the winter. From June onwards the clumps of dandelion leaves produce their strange white flowers; opening always towards evening time, they are an uncanny dead-white by moonlight. The flowers are round, four-petalled, absolutely flat and generally about three to four inches in diameter. Each petal has just a faint venation of greenish-silver accentuating towards the centre of the flower, which is a very pale green. The stamens and stigma are pale lemon-yellow. They are borne on short six-inch stems rising from the ground, no monster spires as in the ordinary yellow evening Primrose. Each flower lasts through the night and the next morning. Towards mid-day it begins to drop and crumple up, assuming a pinkish tinge. Curiously, also, when pressed the petals become quite transparent and only the veins show up, pale mauve-pink, like a network of arteries running through the sheet of the petal.

Like all Oenotheras, each of the flowers lasts little time, but the plants flower in great profusion. Towards July and August they throw out procumbent trailing stems, from which the flowers arise at the nodes. Later the seed vessels develop, little pepper-pots winged at the four corners procumbent on the stem. All the stem of the flower is really style. It is part of such a trailing stem that John Nash has drawn.

The genus Oenothera is a large and complicated one; American botanists have split it many times

OENOTHERA TERAXICIFOLIA

and into many subgenera, so that it is now hardly recognizable. Still, I do not know any other members which can compare in charm, or personality, with the white dandelion-leaved Oenothera.

California contains many excellent plants, shrubs like Romneya and annuals which cover her dry places with flower after rain. The Californian Poppy, *Romneya Coulteri*, is, in my opinion, almost supreme among the white flowers which we can grow in the garden. The flowers are immense, silky and crinkly like satin, while in the centre is a great mass of golden stamens, a ruff surrounding and in the newly-opened flowers almost covering the fluffy stigma and ovary, which looks rather like a small chicken just emerged from an egg. The flower is flat like a plate or, rather, like a great summer hat. It is a flaunting and magnificent flower often five or six inches across, yet with its crinkles and gently frilled edge it is neither coarse nor gaudy. Its whiteness is very pure, a sudden surprise when it emerges from its bud like a great butterfly drying its wings after it leaves the chrysalis.

Romneya seems hardy enough. We grow it against a South wall, but I believe that in the Southern counties it will do well enough without. It is really a shrub and can, if desired, be left to grow as such, and in the milder counties will form a great bush. Around London, however, it is more generally treated without dignity like a herbaceous plant and cut right down, almost to ground, in autumn

after it has flowered. In spring it will then grow up strong young shoots from the base, beautiful in their glaucous fern-like foliage. Often they will reach a height of eight feet before flowering in July, which is enough for most people. Besides, the flowers of Romneya should really be viewed from their own level or from slightly above, rather than from below. An established plant should then continue to flower till autumn frosts appear.

The great thong-like roots do not take kindly to moving and often take a year to recover and flower again. An established clump should be left alone, but often pieces can be taken off the side to form new clumps, while I read that it can also be propagated from root cuttings. I have never been successful with ordinary cuttings.

Romneya was apparently discovered by a certain Dr. Thomas Coulter and its name is a happy combination of his own and that of his friend, T. Romney Robinson, an astronomer. Apparently there was already a genus Robinsonia.

There are three Romneyas in cultivation, but they differ extremely little. *R. Coulteri* is perhaps the commonest and best known. It is easiest distinguished from *R. trichocalyx* by the scent. That of *R. Coulteri* is slightly sweet and not unpleasant. That of *R. trichocalyx* is poppy-like and slightly unpleasant. However, one is not accustomed to poking one's nose into an Oriental poppy, so why should you do so into a Californian one, even a Romneya? With

its smaller-flowered, but wholly charming relative, *Dendromecon rigidum*, I have not so far been successful. Still, I shall probably try again. The flowers are such a rich clear yellow.

And so you may head northwards into the great forests of the Coast redwoods, the Sequoias, which many tree lovers regard as the finest trees on earth. Alas, I hear that many have been ruthlessly plundered without replanting by the lumberman and pulp merchant. Truly the world writes and prints too much. My friend, St. Barbe Baker, tells me, however, that some small part of the redwood forest is now preserved from indiscriminate cutting. There he would establish a permanent "Grove of Understanding". Certainly there is some magic in great trees.

XI

CACTI AND SUCCULENTS

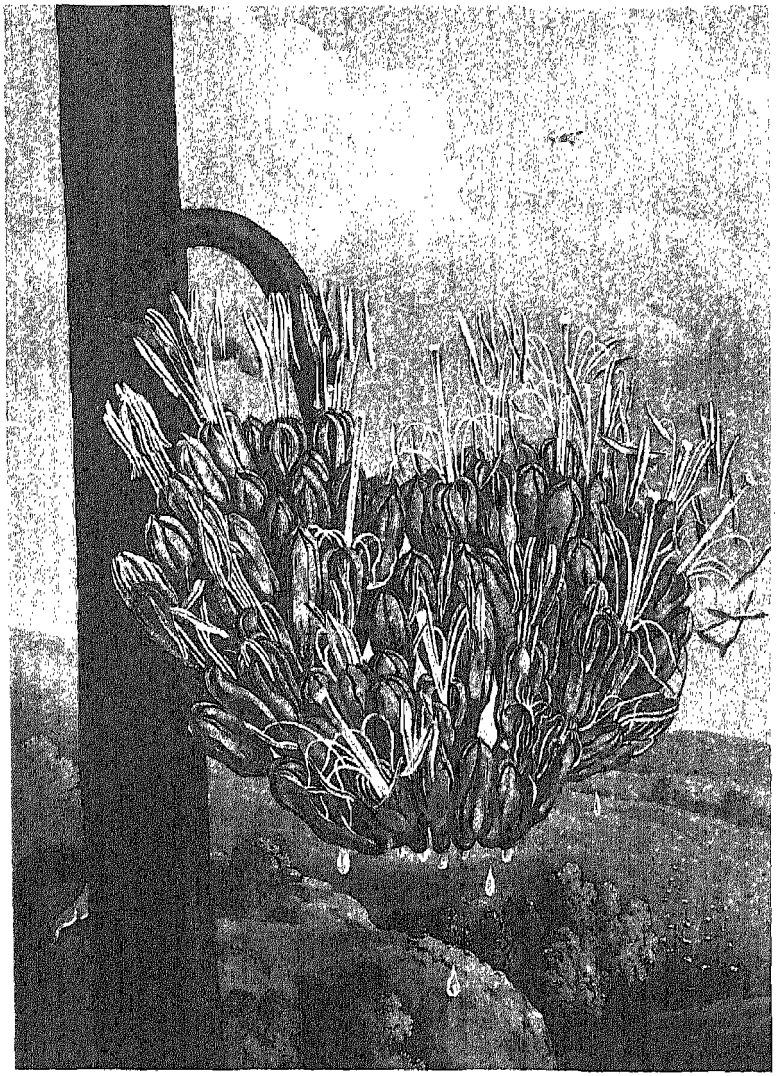
AMONG THE white limestone rocks, steps lead down steeply; I am walking down these steps. Gradually they become steeper and steeper, until I realize that there are steps no more and I am merely clinging to crevices in the rocks, using both hands and feet. But still I go down and down, I don't know why. And then I look down. Below is a curious twisted landscape, a landscape almost of wrought iron. The leaves are great fleshy grey monsters, tinted, and curved like snakes over the ground, but petrified and stiff. Each leaf ends in a spine, sharp like the prow of a racing canoe. Like gigantic sea-shells they lie over the ground, villainous in the half-light. A man falling on to them would have no chance. He would be spiked like a piece of red meat on a skewer. I suddenly realize that the rocks have become a precipice and the precipice an overhang to which I am clinging by the tips of my fingers and toes. An ache spreads first from my fingers, then slowly a racking pain through my hands and arms, up my shoulders, into my back, up my legs, until it is all over me. I scrabble fiendishly with my fingers but there is no longer any grip in

them. . . . I cannot climb back . . . I must fall—I am falling—and then I look down again. The forest of spines has grown longer, the leaves more animal and less vegetable.

And then I wake up.

But my nightmare plants are real, I have seen them by day as well as by night.

All along the Riviera coast, along the roadside, by the railway line, in every garden we see grey forms winding serpentine-like through the air and twisted into all petrified and weird curves, plants made seemingly of wrought iron, not protoplasm and chlorophyll; plants with stiff rigid grey leaves, so sharp and spinous at the end that they would split and tear to pieces a body falling upon them. These are the rosettes of *Agave americana*, a plant from the deserts of Mexico and California, yet here so abundant as almost to seem indigenous. Often perched on the sides of walls, growing between the clefts, their great rosettes six feet or more across, sometimes twelve feet, look like some great insect or some desirous octopus or giant squid, prepared to leap on the unwary passer-by. Yet I find these plants very attractive, possibly even the most attractive part of the parched summer Riviera landscape. They are plants of the sun, and it is a land of sun, where the green plumed palms shadow darker the courtyards of mellow old houses, warmed to a friendly tone of buff and pink until they are part of the sunny landscape, less jarring and



THE AMERICAN ALOE

more attractive than the white limestone rocks, dirtied by age to a dull bone grey.

From these rosettes rise great spikes, often twenty or more feet in height. They are not unlike a stout hatstand in which each peg is covered by a rough flat cap of a warm yellow, changing as it ages to a dull ochreous yellow-green. But they are rough, these flower-heads, sometimes more like hedge-hogs than plants. They are strangely enough, Amaryllids, relations of the lilies. But there is something glassy about these clusters of flowers among which the stigmas rise like lances. Dr. Thornton's artist has also noticed this hard, shining glassiness, possibly these globules of transpiration or nectar, and has portrayed the flowers dropping tears of glass. It is not a falling capsule but a real glass tear that he has drawn—and he was an accurate artist. I can remember that effect. These plants are sometimes called "Century" plants. It was believed that they only flowered after a hundred years' growth and then they died. As the spikes rise, the leaves lose their stiffness and lie on the ground like empty cast-off skins. They are literally empty. The spike has taken all the water from them. It is thicker than the arm of a strong man. I do not know how long these plants do take from the time the seed germinates until they flower. It is probably many years, but I suspect that it is not so long as a hundred years by a long margin. After flowering the main rosette always dies, but often small side rosettes are found

which carry on and generally seedlings spring up around.

All these plants are somewhat formal, yet there is a certain voluptuousness in their loose curves, which seems to provide that extra "rococo-ness" which the austerity of the best modern architecture demands in its garden by contrast. They should not be grown in large pots, but in great curved, bulging olive-oil or water jars they are superb, while the smaller cacti and succulents look well and also grow quite well in bright glazed pots. These can now be bought both with and without drainage holes. Even without actual sun, such plants and jars are suggestive of sun, and do help us to imagine it.

All these plants come from Mexico; they are desert plants, where they grow under a scorching sun; occasional plants, not in close rows as they grow in the sisal plantations of East Africa. They are the accompaniment of great open spaces, wide sombrero hats, and ancient Spanish Conquistadores, proud plants defending themselves against all comers, both animal and human. The drug "mescal" is also distilled from the fermented sap of these plants, a fierce and potent drug which I understand sends its addicts quickly, albeit temporarily, mad and enables them to see visions.

There are many varieties and species of these plants and hybrids have been raised. *Agave Franzosinii* is the finest that I have seen so far. The leaves are very glaucous and thick like great canoes of

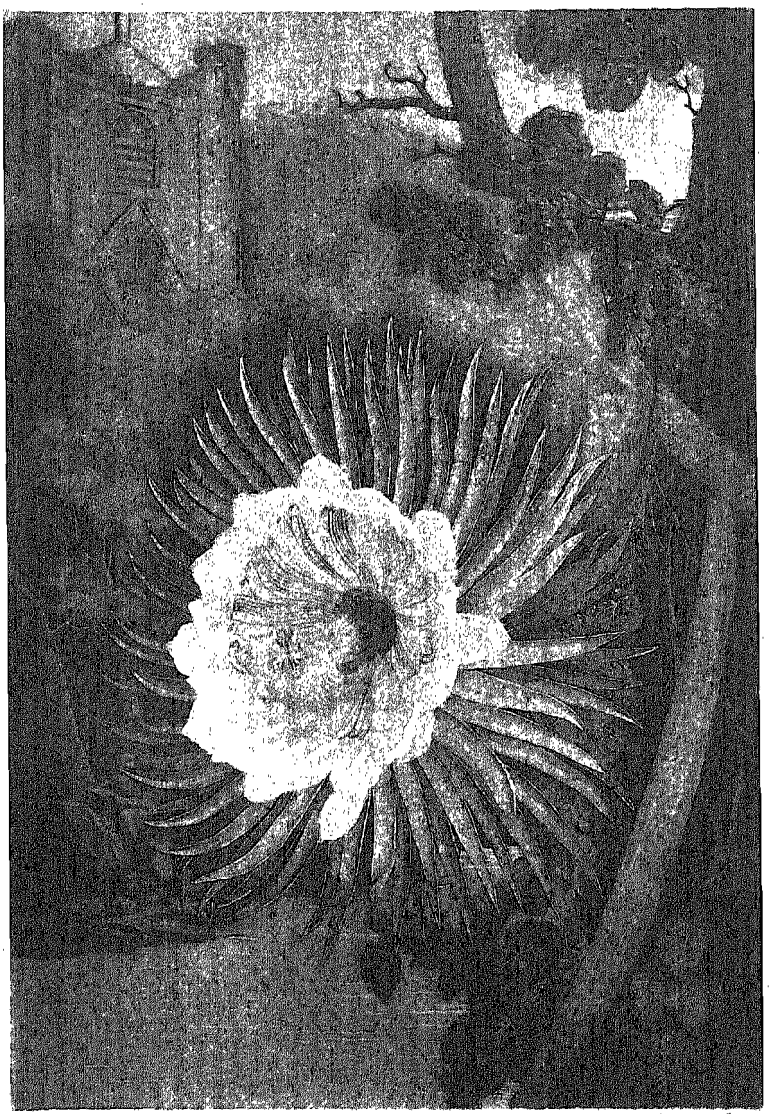
which the centre has been filled in. They are vast, also; one leaf is often eight feet in length, and the whole of the plant must be fifteen to twenty feet in diameter, when it is mature and ready to flower. *Agave applanata* and *Agave asperissima* are also fine species to grow.

Usually I do not recommend variegated plants, finding them fussy to the eye and unnaturally blotchy, like unhealthy and pimply-faced sallow complexions. But the Agave with a yellow streak down the edge of each leaf is undoubtedly attractive and catches the sunlight.

Unfortunately these magnificent plants are not generally hardy in England. Except, perhaps, in a few very warm positions by the coast—and all Cacti and succulents flourish with salt in the air—they must be grown in jars or tubs, and taken in for the winter to a conservatory, or covered in some way with glass. I believe often that it is the damp and not the cold and frost which harms succulent plants in winter in England, and that many more of them could be grown outside if in winter a glass cloche were put over the smaller plants and either a sheet of glass or even windolite, which weighs little, or canvas stretched flat over the heads could be placed over the larger ones. I have kept succulents such as *Cotyledon secundiflora* in Surrey in this way, but Mesembryanthemums do not survive with us unless wintered indoors, but they do survive in some coastal gardens I know and form great carpets

often many yards across, a brilliant sight when the sun opens the flowers.

Many cacti have very large and beautiful flowers. The largest of all are found in the night-flowering *Selenicereus* and *Hylocereus*. These plants were formerly included in the genus Cereus, but have recently been split off into separate genera. The flowers open in the evening at sunset, and by the next morning they are faded and dead. But like many short-lived flowers, they are some of the finest of all the floral world. They gleam, great trumpets of light in the darkness, when the owl hoots and the old church clock strikes midnight. *Selenicereus grandiflorus* is the best known of these plants and is called "The Queen of the Night". The flowers are often over a foot in length, and almost as much in diameter, and are very strongly scented with an odour of vanilla. Reinagle's fine print which we reproduce here is entitled the night-blowing Cereus rather than the night-blooming. Like the flowers of many cacti, they bear a superficial resemblance to a water-lily with a generous abundance of sepals and petals and stamens, almost merging one into another. In fact it is a perpetual wonder to me how a plant living often in a dry environment such as a cactus and adapted thereto, can accumulate sufficient strength and reserves to produce these magnificent flowers. Their magnificence is heightened rather than lessened by the complete contrast of the economical and spinous plant body.



Flower by Reinagle Moonlight by Pether

THE NIGHT BLOWING CEREUS

Nor is their flowering an occasional event; an established plant which has attained a certain size should flower regularly every year, and produce a succession of blooms. The predominant colours of the flower are yellow and white. The sepals, which are rather narrow and even spiky, are light yellow inside and yellowish-brown outside. They stand out like a sharp pointed ruff framing the head of the flower. The petals are broader and pure white, and there are several interlocking ranks of them as in a water-lily, while inside there is a generous sheath of golden stamens and a whitish style.

Selenicereus grandiflorus comes from the West Indies. The plant body is not squat like many cacti, but is long and slender and the plant actually climbs and scrambles about the place, and often produces aerial roots. The stem is angular, often only an inch in diameter, and there are short needle-like spines in groups at the areoles. The plant is not actually an inhabitant of deserts as are many cacti, but is often found at the edge of the forests in semi-shade. I believe that some species of Hylocereus are even found as epiphytes and semi-epiphytes in the forest. Consequently in England it does not require to be kept so dry as many cacti and some leaf-mould, and even old decayed manure may be mixed with the compost. It is often planted out in a bed in the greenhouse, and trained up the wall. In winter only a little water is required, but in summer when the flowers are forming it requires ample water, and

may even be syringed with advantage. I have also heard that it is grown the better if it is given some shading in summer, rather than with full exposure to the sun through an unshaded glass. The plant flowers in the summer, the buds generally appearing at the end of May or in June, swelling for a month and then bursting, rather suddenly in the end, into flower one night towards the end of June or in July. This vast flower produces a fruit which is very much smaller than itself, roundish and two or three inches in diameter, yellow and red in colour and bearing short yellowish spines.

These great flowering cacti are easily grown in a slightly heated greenhouse. They do not require a stovehouse, while on the Riviera they are often seen growing outside. I first saw one of the great buds about to burst in the Jardin Exotique, at Monaco, a nightmare place bristling with cacti placed in holes in the limestone rocks and terraced with beds and staircases enclosed with concrete fences shaped like rustic wood, a place singularly soulless in design for such a marvellous aspect, but nevertheless possessing some fine specimens of cacti, magnificently grown. The huge plant, labelled *Cereus triangularis* and more frequently known by that name than its proper and more recent name of *Hylocereus undatus*, was climbing up a rock face about twenty feet high and clinging like ivy. The great buds, the size of a good Crinum bulb, were towards the top. The flowers of this species

are very large, yellow and white in colour, but the outside is slightly purplish. It generally flowers about a month later than the Selenicereus. All over the tropics this plant is now found in gardens and often escaped into the wild. The plant was first described from a specimen collected in China but there it was evidently a cultivated plant and not a native. In fact it is difficult now to trace its original home, but it is probably in the West Indies, possibly in the mountain forests of Martinique where it was collected by Père Duss in 1884. In Yucatan there are two forms. One is called "chacoub", the other "zacoub", and the fruits are sold in the market for eating. They are red and are said to have a good flavour.

In Honolulu there is a hedge half a mile long which is said to produce five thousand flowers in a single night, and people travel from all parts of the island to see it. All these plants are particularly beautiful, when seen by moonlight or by artificial light since in their petals there is a certain silkiness, which causes them to glow and to change colour like a rich velvet. This metallic sheen is only found in a very few genera of plants. It is found in the *Mesembryanthemums* and the *Portulacas* and in a few *Ranunculus*. The largest flowered of all these species —and indeed the largest flowered of all the cacti— is *Selenicereus Macdonaldiae*, which has the same yellow and white flowers as *S. grandiflorus*, but the outer sepals have more purple colour in them and

the flower has very little scent, while the scent of the "Queen of the Night" is almost overpowering. It comes from Uruguay and Argentina. There are a number of other species both of *Hylocereus* and *Selenicereus*, which have flowers very similar to those already mentioned. All are desirable in cultivation. There are also a few species with red or pink flowers. The best of these are *H. stenopterus* from Costa Rica which has violet-red flowers, about half the size of those of *H. undatus*, but still very large and beautiful, and *H. Purpurii* from Western Mexico, which has red sepals and pale pink petals which fade almost to white. The flowers are large. Both of these species require slightly more heat than the yellow flowering kind.

The other group of cacti, which are commonly cultivated for their flowers rather than the form of their plant body, is the *Phyllocacti*, or rather the *Epiphyllums*, as they are now more correctly called after the American shift round of cactus nomenclature. They are mostly epiphytic plants, natives of Mexico and South America, and their flowers are open during the day. They are short-lived, but in an old plant they are borne in great profusion. The flowers are often very large, sometimes a foot in length, almost as vast as those of the Selenicereus. In addition to sixteen fine species, there are innumerable hybrids and the commonest of these is *Epiphyllum Ackermanni*, which has been in cultivation so long that it was at one time thought to be a

species and was described as a native of Mexico. Professor Borg, however, tells us that it is a hybrid raised in England between a species of *Epiphyllum* and *Heliocereus speciosus*. The flowers are a rich deep red, dazzling and glowing like red satin or velvet in the artificial light. This plant is very free flowering and very easy to grow. Often magnificent specimens are seen in the windows of old country cottages. They require very little attention and may be stood out of doors during the summer, when they should be given plenty of water. Since they are epiphytes and not primarily desert plants it is probable that they grow better out of the full sun in the summer which quickly causes the flowers to fade. The colours of the hybrids range from pure white to deep crimson, through all shades of pink and yellow. There is even one very striking variety with flowers orange and violet. I saw it in flower once at Kew, but unfortunately have not its name. The largest flowered species is probably *E. macropterus*, which has flowers yellow and white up to a foot in length. There is little attraction in the flattened green stems of these plants, but they are inconspicuous and the flowers have so much personality and are so striking that they easily compensate for the dull plant body. Both these *Epiphyllums* and the big *Selenicereus* are easily propagated by cuttings. Like all cuttings of cacti and succulent plants these should be placed in a dry spot for a day or two at least before planting, until the wound is well

healed. This is important to prevent rotting of the cutting.

The cacti are almost entirely confined as natives to America where they are found from Alaska to Patagonia, from the high Andes to the low deserts. Only a few species of Rhipsalis are found in West Africa. Opuntias, prickly-pears, have become naturalized in many regions, notably along the Northern Mediterranean and in Australia, the latter with disastrous effect.

In the Old World and especially in South Africa, other genera of plants, notably the Euphorbias (spurges), the Aloes and the Mesembryanthemums have become adapted to life under conditions and periods of extreme drought, and they show many modifications very similar to the plant body of the American cacti. We will discuss one of these here —*Euphorbia splendens*, one of the prickliest plants I know, and generally known as "The Crown of Thorns". Unfortunately this plant cannot be the original "Crown of Thorns" of the Bible, since it is an endemic plant to Madagascar, where it was first found by Professor Bojar on the borders of fields in the province of Emirne. It does not occur in Palestine. In Madagascar it is known by the delightful name of "Soongo Soongo".

Euphorbia splendens has long prickly branches often climbing or straggling about the place. The branches are tough and wizened-looking, like old men, and they are covered with stout spines about

an inch long. There are only occasional small green leaves. The chief attraction of this plant is the two big red bracts which cup each group of flowers. The actual flowers are minute and most inconspicuous. There is a strange simplicity about these two bracts which makes the "flowers"—for so nearly everyone thinks of them—so alluring. All through the year there are flowers on the plant, little groups standing out on short sticky stems, but the chief flowering period is in the winter.

Euphorbia splendens is an excellent cool greenhouse plant and also does well in a sunny window. It does not require so much heat as its relatives the flamboyant Poinsettia and the winter-flowering *E. fulgens*, which is also a delightful plant, but hardly a succulent.

South Africa is the home of many of the succulent plants in cultivation, and these even exceed the cacti in the extraordinary and interesting developments which have occurred in them to enable them to live in their peculiar environment. In the Cape Province and in the South African deserts, the Great and the Little Karroo, the southern Kalahari and much of Namaqualand there are great tracts of country, often comparatively high in altitude, where there may be no rain for years together, and where the only source of moisture for the plants is the heavy dew precipitated by the great difference between the day and the night temperature. Often during the day the average temperature may be

108 degrees F., while the soil may even be as hot as 140 degrees F. At night the ground loses its heat more slowly than the air, whose temperature may drop right down to 32 degrees F. The relative humidity of the air may be lower than twenty per cent. In England it is generally above fifty per cent. and in many tropical forests the air is often saturated, and there is a relative humidity of a hundred per cent. The soil is sandy and in many places even saline, and mixed with the sand is often a weathered and broken-up debris of red or yellow schist. It requires tough plants to live under these kind of conditions and the Aloes and Mesembryanthemums are tough plants, tough to handle if you try tearing a leaf across, tough in their resistance to adverse conditions over long periods, periods in which much of the flora of the regions remains below ground in the form of bulbs or seeds to spring up and bloom sometimes in a few days or weeks after rain.

One of the finest Aloes is *Aloe variegata* from the Cape Province, which grows well in this country in cool greenhouses or even in sunny windows, and is often called the Partridge-breasted Aloe. The leaves are succulent and boat-shaped and surround the short stem very closely, hiding it completely. They grow in imbricating ranks at an angle of thirty degrees or so from the stem, and often there are thirty or more of these succulent boats, keel outwards, on a plant only a foot high. The leaves are deep green in colour, and are crossed transversely

with wavy white bands, so that the general effect is not unlike the breast of a bird, particularly a partridge. The flowers are a dull red in colour, tubular and pendulent and borne on a stem which rises from the centre of the leaf rosette. They harmonize extraordinarily well with the leaves; the flower spikes seem to continue upwards like a spire, the essential form of the leaves, so that the whole plant is an artistic unity in appearance as well as in fact. There are so many plants in which the flowers and the leaves seem artistically disunited in form.

Much of the Great Karroo and the Cape Province is covered by the shrubby *Mesembryanthemums*; the best-known representatives of this vast and variable class is the pink-flowered ice-plant *M. blandum*, which grows so freely by the sea in Cornwall. Always the leaves are cold to touch, even on the hottest days. The flowers are daisy-like and brilliant scintillating pink, about two inches across, and the ray florets surround a mass of powdery golden stamens. The leaves are grey, curious little boat-shaped succulent masses, often only half-an-inch to an inch in length. There are many varieties of these brilliant flowered *Mesembryanthemums*. One of the best is brilliant orange; it is even stronger in colour than the marigold. It is called *M. aurantiacum*. Then there is *M. coccineum*, with scarlet flowers produced nearly the whole summer. The colour is a fine orange-red and not a fiery warlike geranium-red, killing everything near it. There is also *M.*

tenuifolium with shining orange-scarlet flowers and leaves which are awl-shaped, verging on the cylindrical. There are numerous smaller-flowered varieties, which are, to my mind, even more attractive than the larger-flowered ones. In the sun they are absolutely covered with flower in all shades of pink, orange, apricot and crimson.

In the warmer counties these small shrubs are hardy and flop in great masses down over walls even as Aubretia does in the cooler counties. Except in these warm counties, however, the Mesembryanthemums must be taken in during the winter, but they do not require much attention and may be lumped together in quantity in boxes. They are well worth this trouble, however, since their effect in summer on the rock-garden is so glorious and brilliant, when often there is little else that is colourful there. Mesembryanthemums are excellent also for growing in cool greenhouses, especially those built up with beds or rock-work or in those big terra-cotta vases hanging down in cascades. They are cheap to buy, and extremely easily propagated by cuttings at all times of the year.

There are other kinds of Mesembryanthemums also which inhabit the dry countries of South Africa, species which appear to mimic pebbles and stones, as exactly as stick-caterpillars and insects mimic twigs, and leaf-butterflies dead leaves. It is possible to look for some minutes at a piece of ground covered with pebbles and with these cacti, and be

MESEMBRYANTHEMUM BLANDUM

still uncertain which are stones and which are plants until you touch them. Some have the most beautiful mottled patterns like lichens on rocks. There are others which have their green chlorophyllous regions deep-seated in their tissues, and above little transparent windows through which the light can penetrate, its damaging intensity reduced. And out of these vegetable pebbles will sometimes be thrown up a sessile yellow or red flower, dandelion- or daisy-like.

I believe that it is possible to find beauty in these strange plants, in their astounding adaptations to their environment and their mimicry, still a puzzling phenomenon in plants where it is no easier to explain than in insects; if anything, more difficult. Many modern architects and designers have tried to show that some part of beauty lies in the fitness of a house or an object for the purpose towards which it was designed. May it not be possible to find this same part of beauty in these plants? In England where they must be under glass for at least part of the year, I am sure that the best way to grow them is not singly, in pots, but in stone troughs or sinks like choice Alpines, or in raised beds with rocks in the greenhouse. They need a natural background and should be raised up above the ground-level practically to waist-level for the proper appreciation of the plants. Cacti and succulents, as well as Alpines, also relish the sharp and good drainage given by a well-made-up stone trough garden. But even among the

finest of the South African succulents and bulbs, there is a glitter and a hard gaudiness which is very different from the soft tones and the voluptuous luxuriance of the big Selenicereus flower and the smooth warm languor of its scent. Perhaps this difference is similar to that between Africa and Oceania. Perhaps to appreciate to the full the flowers of the plants of the South Seas it is necessary to have experienced love as the Tahitians know it, perhaps the last uninhibited society in the world, and that, I gather, only a changed wraith of its former stature and natural life. And few of us have experienced that.

X

BLUES AND PURPLES

WHY do these colours in flowers seem to us more ethereal, yet more eternal, more in tune with the infinite than reds and oranges? To me they seem peaceful; they suggest affinities with the sea and the sky, great distances, parts of the world which are unmarked and unchanged by current troubles, while red and orange flowers suggest violence and fire, desolation and heat. There seems to me much more peace in a garden of blues and purples than in a garden of reds and oranges.

I once saw a long border flagged with stones leading to an old castle and entirely planted with rich purple heliotropes and petunias. I have never forgotten the effect. An occasional clump of brilliant scarlet or flaming orange often serves to accentuate a foreground and to provide a contrast.

As I write a glorious specimen of the red Emperor form of Tulip Forsteriana illustrates my remarks and gives me much pleasure. It is brilliant and yet so rich in its shadow. But it is the blues and purples which carry the eye away into the distance until the garden seems to blend imperceptibly into the coun-

try beyond, and allows the imagination to riot uncontrolled over the whole world, as indeed it should wander in a garden, a contrast to and a release from the discipline which our work must sometimes exercise upon it. Away we go, soaring in the skies as any stratosphere flyer when we look at blue anchusa, up into the mountains where the air is keen and fresh when we look at *Gentian verna* or think of *Eritrichium nanum*, away to the great Himalayas with *Meconopsis Baileyi*, into the palaces of great kings when we enter a greenhouse where grows the royal purple Tibouchina.

When we think of such flowers we hate the scarlet geraniums and flaring Salvias. They bring the distance up too close and destroy that peace which is the chief value of a garden. Let us leave them to the dictators of whose beastly warring instincts and policies they remind us.

We have already dealt with the fiendish Puya, that subtle beauty which Clarence Elliott brought from Chile, and with the wonderful powder-blue *Lobelia Wollastonii* from Ruwenzori, the Mountains of the Moon. But my thoughts and perhaps my wishes consistently wander to mountains, so let us talk here of *Eritrichium* and *Gentian*.

Probably no one has enthused more charmingly or made his enthusiasm for Eritrichium more infectious than did Farrer. His very name, The King of the Alps, has stuck to the plant ever since, and every description now is sure to owe something

consciously or even sub-consciously to his writing about the plant. I gladly acknowledge the debt.

It was at Mont Cenis, one of his own favourite hunting grounds, that I found it for the first time. We crossed the blue-green lake in brilliant sunshine and then I left the rest of the party and struck up along a little path into the higher mountains. For several hours I wandered and the mist came down around me, cold and grey and damp.

I had almost given up my hope of finding the blue jewel. Still there were patches of snow about although July was well advanced.

A hundred yards ahead of me there was a bend in the track. I mentally resolved with myself to go so far to look round the bend and then to return in haste. But my luck changed. Round the bend the valley narrowed into a small rocky amphitheatre and on the rocks, sticking to all the cracks vertically and horizontally, were great cushions of Eritrichium, wonderful rich blue Myosotis flowers almost adpressed to a beautiful grey silky cushion, gleaming like silver in the brilliant evening light which comes before a heavy storm-cloud.

The blue of Eritrichium seems a real, an absolute blue, soft as the sky yet richer and more intense than any sky or any sea that I have seen. The ordinary forget-me-not is a lovely blue, yet compared with Eritrichium it seems mean and poor. Colour, like every other sensation, is relative rather than absolute, although it is probably not for us in this

world to see or even to imagine a finer blue than that of Eritrichium.

Alas, it has proved practically impossible to grow "The King of the Alps" satisfactorily in England. It is just possible to keep him alive pampered in a pan in an Alpine house and watered always from below, and then only in summer, and occasionally he will flower a little and win his owner a prize at a show, but I have never seen anything in England to compare with the glory and freedom with which Eritrichium flowers in the Alps.

Although in a few places like the one I found at Mont Cenis, Eritrichium is abundant, covering every rock, it is generally considered a rare plant and only grows high up on granite rocks. It avoids limestone. It has, however, a wide range, being found in the Arctic as well as the Alps and as far away as the Aleutian Islands.

We are always tempted to collect such beauties, especially those so hardly found as Eritrichium, but it is wiser to leave them in situ and thrive on the memory of the glory, rather than on the reality of the tiresome miffy little plant which is all that you would be likely to grow in England. Rather here should we grow *Myosotis rupicola*, which is a really beautiful dwarf forget-me-not and easy enough of cultivation, much more brilliant than the ordinary forget-me-not, although of course not nearly the same as *Eritrichium nanum*, which, incidentally, by the strict rules of priority nomenclature should be

called *Eritrichium tergloviense*; still few of us think or talk by the strict rules of nomenclature, and although we may conscientiously write *Eritrichium tergloviense* and *Iris unguicularis*, we all talk of *E. nanum* and *Iris stylosa*, and it seems over-pedantic in these cases to do otherwise when one name has so thoroughly entered into the national consciousness.

There is also the wonderful little *Myosotis Hookerae* from the Himalayas, which is clothed in white hairs, and its dense mass of little branches make a tussock with flowers of brilliant forget-me-not blue. However, I have never seen it in cultivation in England and I have heard that it is almost as difficult as its royal cousin from the Alps.

If you must have an Eritrichium, just for the name of the thing, get *E. strictum*, an attractive Himalayan species with pleasant little silvery-grey leaves. It is not a cushion plant and its flower stems are often eight inches high like a Cynoglossum, but the flowers are rather small and hardly better in colour than the ordinary forget-me-not. It is a plant for scree or Alpine house.

Another Boraginaceous plant which always seems to me to have personality is *Omphalodes Luciliae* and this again is an excellent plant for Alpine house or scree, especially scree frame, while occasionally the real expert may manage it in the rock garden, without special soil mixtures or winter protection. When it is really happily established it will quickly form a mat about a foot in diameter of close silvery-

grey spade-shaped leaves, while its beautiful pale china-blue flowers should be followed with masses of self-sown seedlings, which always form a gift of distinction for other gardeners. The flowers are borne in sprays about a foot or so long. Their colour is very subtle, a silvery china-blue, sometimes faintly tinted with pink like mother-of-pearl, yet they don't at all have the appearance of washed-out forget-me-nots as my description up till now has rather implied. Theirs is not the kind of personality which provides a devastating shock when you first see it as does *Eritrichium* or *Gentian verna*. There is nothing violent about it. Rather is it soft and gentle, the kind of plant which improves on acquaintance and which it is pleasant to live with. I don't think that one could live always with *Gentiana verna*; it is too violent, but as an annual experience it is wonderful.

Among the royal blues the Borages also provide us with many fine plants; even the common Borage should not be despised, while the Anchusa is one of the glories of the summer border, and *Lithospermum*, Heavenly Blue, is one of the finest rock plants I know. We grow Anchusa Morning Glory behind a row of *Iris sibirica* and the result is very pleasing, while it calls for as little attention as any part of the garden. The dwarf Anchusa from Crete, *A. caespitosa*, also promises to be a first-class plant of great distinction. Its flowers are absolutely cæspitose. The only danger seems to be that the leaves may

rather mask the flowers if it is treated too kindly. It might be desirable I think to provide an artificial goat in the form of shears for some of its over luxuriant upstanding foliage. The flowers are the good Anchusa blue, mine so far about the size of a sixpence, but my friend Peter Davies promises me flowers as large as a shilling. It has just recently flowered for me and grows in a scree mixture quickly and easily.

The name Morning Glory leads us on to Ipomoea and Convolvulus. In every garden in the tropics and near tropics we find blue morning glories *Ipomoea rubro-coerulea* and sometimes also the great white Moonflower *Ipomoea bona-nox*. In Japan nurserymen report a race of Ipomoeas eight inches across. In England they can be grown easily as greenhouse creepers. No great heat is required, in fact *Ipomoea rubro-coerulea* will succeed outside like a half-hardy annual if the summer is warm.

The Ipomoeas and the Convolvuli are very closely related and very similar in flower. In fact the name Ipomoea is derived from the Greek word "Ips", meaning bindweed, and "homaios" like, the plant that is like bindweed. The Morning Glory flowers are funnel-shaped and generally about four inches in diameter, perfectly round. Their colour is the clearest shade of sky-blue that I have ever seen in any plant, the kind of sky which we imagine for a summer day but rarely see, and even at the best imagination is better than reality, although not with this plant.

The plant is called rubro-coerulea, but there is not really a trace of red in its wonderful morning colour, although there is certainly a trace of red in the Perennial Morning Glory *Ipomoea Learii*. Towards the base the colour fades away, leaving it clear white. The petals have a silky sheen to them which makes the flower look as if it were made of the finest china, delicate and ethereal. Each flower only lasts for a day, often less than a day, but each morning there should be a new crop. Towards evening the rubro tint comes into the flower, first as fine delicate rays where the petals have joined to form a trumpet, then it gradually suffuses over the whole flower until it fades.

Ipomoeas are very easily raised from seed. The seeds should be chipped or soaked before sowing. They germinate best in a warm greenhouse, but it is quite possible to grow them without. There is an early flowering form called praecox, which comes into flower quicker from seed than the normal species and is by that extent more desirable. I have, however, found it somewhat lacking in vigour. The ordinary species will grow six to ten feet in a season and is excellent for the walls or pillars of a greenhouse. It also grows well up strings. This year we started seeds in March and every morning in June and July we have had flowers, sometimes forty or fifty from three pots festooning the walls and roof of the small greenhouse, in which there is no artificial summer heat. A friend, to whom I gave seedlings,

has successfully flowered them outside. The perennial *Ipomoea Learii* will grow very large in time, and cover the roof of a big greenhouse, but the flowers are glorious seen against the light. They should be lovely also against a white wall or trailing over the edge of one of those vases just off-white in colour. I once saw such an arrangement with scarlet *Salvia Grahami* in great branches, and the result was magnificent.

All Ipomoeas like sun, as much as you can give them. They always do best in a warm summer. Although all Convolvuli will grow in an ordinary poor sandy soil, the Ipomaeas make such rapid growth that they can stand a certain amount of manure and rich feeding. In fact, they do better for it. They do well in large pots or planted out in a bed in the greenhouse.

In the tropics at Taprobane, a dream island off the coast of Ceylon, the Comte de Mauny in his most charming book, *The Gardens of Taprobane*, reports that the white moonflowers, *Ipomaea bona-nox* (sometimes listed as *I. grandiflora alba*), will flower in a month from seed. I remember them also in the gardens of Borneo, by the coast. Night-flowering plants are fascinating to me and like the great night Selenicereus, the largest flower among the Cacti, the moonflower is the largest Convolvulus. The flowers are pure white and open at sunset from spirally furled buds, often in half a minute as you watch. Ghostly white in the moonlight, they are a

perfect accompaniment of the Cicadas' chirping and the soft warm tropic night.

The ordinary hardy Convolvuli, major and minor, as opposed to the half-hardy Ipomoeas, should also not be despised. There are some glorious colours among them and they require little attention. Many people avoid them for fear that they might become too intrusive, in the same way that some gardeners avoid Aubrietia for fear that it will smother all their rarer plants. Still, I feel that such fear is only necessary in the case of such very intensive stranglers as *Polygonum Baldschuanicum*, and even that is a glorious plant in the right position, growing over an old shed or tree. If we always avoided a slice of cake for fear that we might be ill if we ate the whole, our gardens would be much poorer in colour.

Brilliant coerulean blue is not a very common colour among greenhouse plants. Many of them do, however, tend towards mauve and purple. I know no flowers, however, so royal in their purple, so rich and velvety, as those of *Tibouchina semi-decandra*, the subject of John Nash's drawing for this chapter. They are large flat saucers often three or four inches in diameter, while the stigmas project like a farmer's pronged fork out of the centre of the flower. The colour is uniform all over the flower except that from the centre of the petals there radiates a slight deep crimson venation. They are regal in every aspect, even the rich crinkly leaves,

TIBOUCHINA SEMI-DECANDRA

while the flowers are the monster jewels at the head of the toad, exotic yet in this case real. Their colour is absolutely clear and the satin sheen of the petals makes them gleam as the light is reflected. This is a quality of some plants and makes the petals shine as if they themselves were a source of light. It is frequently found among the Melastomaceae, the family to which Tibouchina belongs. The very best of the deep mauve-purple petunias approach Tibouchina in colour, but I do not think that they equal or excel it. Indeed it would be difficult to do so.

Tibouchina comes from Brazil, and was first discovered by a Mr. Linden in the province of St. Catherine. A friend has told me that it grows in great bushes among the grey rocks of the hills and mountains. It must be a wonderful sight since silvery-grey is one of the finest backgrounds for rich purple colouring. It is probably the finest flowered of all the Melastomaceae, although I myself have seen in East Africa several very fine ones. In name it has varied considerably and has been figured both under the generic names of Plerome and Lasiandra. In the *Botanical Magazine* there is a wonderful plate with very fine colouring under the name *Plerome macranthum*.

As Tibouchina forms a large shrub it is best planted out in a bed in a cool greenhouse, although it is quite amenable to pot culture, and I had it so for several years before I planted out. Its only fault is a

tendency to extreme straggliness which quickly develops if it is not pruned hard after flowering. It will flower in September, October and November and should be pruned soon afterwards or in the early spring. Some growers, however, leave it unpruned and train it like a climber to the walls and roof. It does not require much heat; in fact a house in which the frost was just kept out in winter and the heating turned off in summer, is quite sufficient.

Tibouchina is sometimes called the Brazilian spider flower presumably from the striking prong-like stamens, but I do not think the name is very apt.

The tale of blue flowers is long and the ordinary garden hybrid Delphinium occupies a prominent place in it. They are gorgeous. The Delphinium species, however, receives less attention and there is one which I should like to mention: *Delphinium macrocentrum*, which grows between nine and twelve thousand feet on Mount Elgon, Mount Kenya and the Aberdares, three of the Equatorial mountains of East Africa. It is not a very large plant, two to two-and-a-half feet at most, and it grows at the edge of the forest among long grass and sometimes, as we found it, on Mount Kenya among grey rocks. Its strange colour is a fitting complement to the surrounding peculiar vegetation, the gigantic Lobelias and Senecios, plants of dreamland, strangely embodied, and remaining till daytime.

I do not know of any other plant which attains quite the same subtle and electric shade of blue as this Delphinium. Only the famous *Puya alpestris* comes near to it and I think that the Delphinium is even more vivid. It seems to combine the clearness and etherealness of the sky at sunset with a touch of green, and also contains the more vivid, more chemical tone of a solution of copper sulphate. It is distant and elusive in one glance, yet near, electric and vivid in another.

Unfortunately, although I have flowered *Delphinium macrocentrum* in this country I have not been able to attain the wonderful shade of blue. The flowers were almost green and not very exciting, in fact miserable when compared with the original. The flowers are not very large, about half an inch across, spurred and borne loosely aggregated together at the top of the stem. They do not spread along the stem in a raceme as do the flowers of the common garden Delphinium.

Another good Delphinium species is *Delphinium Welbyi* which comes from Abyssinia, the home also of that excellent garden plant *Kniphofia Galpini*. It has pale powder-blue flowers and rather long spurs.

Blue and mauve is rarer in shrubs than in herbs. However, there are several which I can thoroughly recommend. *Ceratostigma Willmottianum* is one of the most valued plants in my garden. Its flowers are brilliant blue, almost as brilliant as those of a Lithospermum Grace Ward or even a Gentian, lighter than

Verna, a little darker than Farreri. It is easy of cultivation, best against a warm wall and although rather damaged by frost in the winter it always springs up again as strong as ever; at least, it has done so during the five or six years that we have had it, making a round bush four feet high and as much through speckled with flowers over a large part of the summer, often beginning in early June. The flowers are round, about as large as a sixpence. One or two of a cluster appear together, but there are always enough on the bush to make a blue display. We owe Ceratostigma to Wilson, who discovered it in Western China.

The other blue flowered shrubs I would recommend are Ceanothus and Althaea, the shrubby Hollyhock *var. Coeleste*. All the Ceanothus are attractive, not plants of devastating personality at the first acquaintance, but pleasant to live with and improving from year to year; theirs is a mild and unassuming personality, powder-blue in colour and powdered in texture.

The pale blue of Ceanothus Gloire de Versailles or the slightly darker blue-mauve of *Ceanothus rigidus* shows splendidly against a white wall. It also blends harmoniously with the mellowness of an old brick wall. In Ireland and in the South-Western counties, Ceanothus can well be grown as a bush or even a small tree, but in the Home Counties it is best placed against a wall. The Hollyhock *var. Coeleste* seem to take some time to settle down.

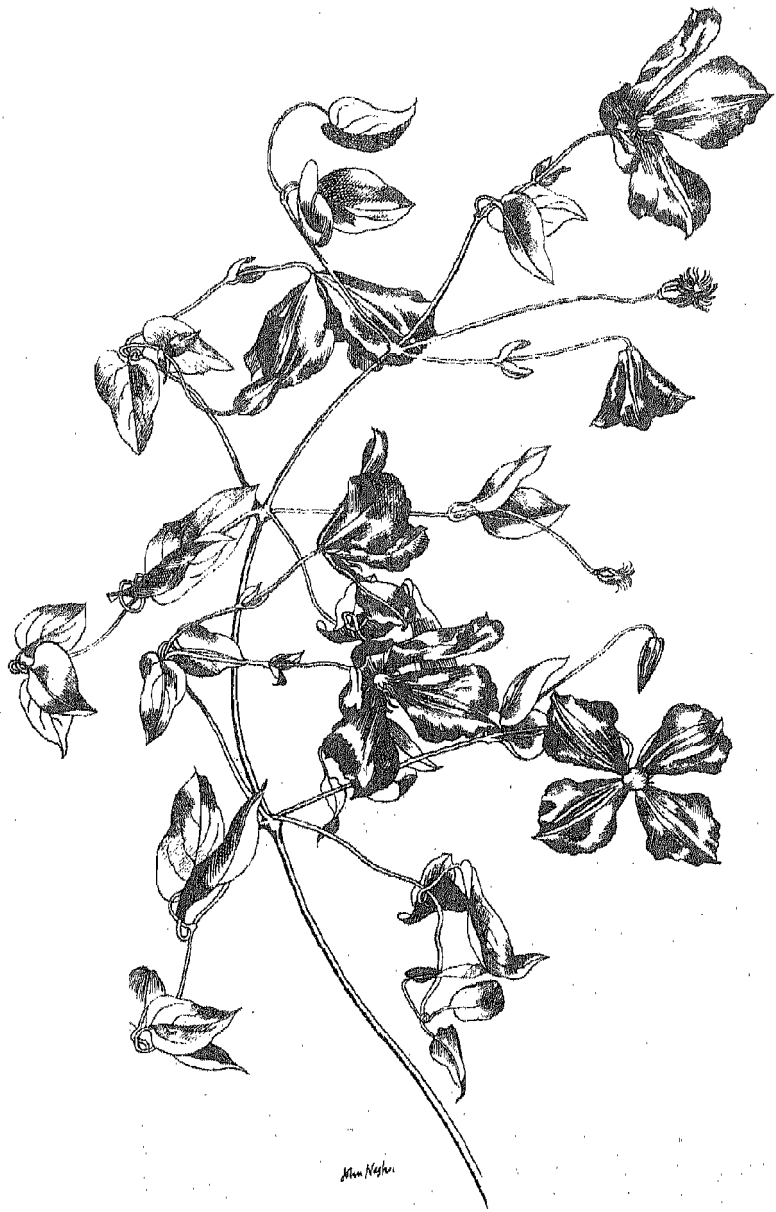
In a warm August, however, its pale China blue flowers are a pleasure when there is little in the Shrubbery. As far as I know it likes full sun.

Rich mauves, deep purples and clear blues are not very common colours to find among climbers, yet there are few floral sights more attractive than a mature *Clematis Jackmanni* cascading down from an old tree or climbing among a mass of Paul's scarlet climber roses. Like wine Clematis seems to improve with age. Every year the flowers seem to be larger and more freely produced than before. I think that they also tend to get stronger in colour as the plants become established. Clematis is naturally more a scrambler than a climber and it seems to benefit from association with other plants. To see Clematis cascading down from the branches of an old tree reminds me always in some slight degree of a tropical forest where lianas hang in luxuriant ropes and green festoons. Wistaria is another splendid subject for such treatment; so it is worth thinking twice before cutting out that old tree which is half dead or the hulk which was struck by lightning in the last great storm. I do not think also that Clematis would often do any harm to healthy trees. It is not a smotherer like ivy. Clematis Jackmanni is an old established favourite. It is a wonderful colour, a deep rich purple in flower and the plants are vigorous, good doers which cannot be claimed for all the modern large flowered varieties.

I can also strongly recommend *Clematis President.*

It has the same rich mauve and purple colour; the flowers are perfectly symmetrical, with more petals than is usual in *Clematis Jackmanni*. It is also larger in flower, being often quite six inches in diameter. The petals are deep mauve in colour but down the centre of each there is an unobtrusive ray of richer purple, melting at the sides into the mauve. President is also an early flowerer, generally towards the end of May. I am also fond of the white *Clematis Henryi*. It is a large-flowered hybrid and not a species as the name might suggest.

But still I think that the most distinguished Clematis of all is *Clematis macropetala*, which Farrer sent us back from Western China. Farrer himself wrote from Western Kansu and I quote his words from the *Botanical Magazine*: "Here it rambles frailly through light bushes, to the height of two or three feet, and then cascades downwards in a fall of lovely great flowers of softest china-blue, so filled with petalled processes that they seem as double as any production of the garden." Frailly is undoubtedly the perfect word to describe its scrambling; yet it is tough like the alpine clematis *Atragine alpina* and the flower follows the same pattern, rather than the soup plate pattern of *Clematis Jackmanni*. The flower, however, are much larger than those of the alpine clematis and much more petalloid. The four outer sepals are generally a delicate shade of mauve. Sometimes the flowers are three or four inches wide and the centre is filled with a mass of petalloid



CLEMATIS IACKMANNI

segments, decreasing in tone from mauve to pale powder-blue as the centre of the flower is reached. They are all clothed with down. But both in size and colouring it is a very variable flower. Mr. Markham has produced a pale pink form but I do not think that it is nearly so attractive as the type. The colour also probably varies with the amount of exposure to the sunlight. The best plant I have ever seen was about ten feet high and growing up a west wall which was shaded strongly. The plant is spread over a large part of Northern and Western China, but I gather that it is never very common. It was apparently first discovered in 1742 by the French botanist d'Incarville, after whom the genus Incarvillea is named. He found it in the mountains around Pekin. It was also found by Przewalski, of horse fame, in scrub on the Muniula mountains which separate the Ordos desert from the arid Mongolian plateau. But it is to Farrer and his companion Purdom that we owe its introduction.

Extreme personality also seems to me to reside in the genus Iris and their dominant colours are blues and purples. But several excellent books have been written on the genus and I do not intend to try and compete here, as in the same way and often for the same reason I have refrained from discussing Gentian and Meconopsis and have not even mentioned Nomocharis. No one could possibly despise the barbata Irises, the beautiful clear pale blue of Aline, the dusky smouldering purples of Depute

Nomblot, the rich combination of Lord of June and the regal darkness of Joanna or Maisie Lowe. None of these we can neglect, but still to me the most exciting Irises of all are the Oncocyclus group. Alas they have the reputation of difficulty, miffiness and short life. However, if their requirements of drying off, baking as if in an oven, for the second half of the summer are observed, either by lifting or by putting a glass over the beds, I do not think that they quite warrant Farrer's gloomy description: "A high proud race are the Oncocyclus Irises—a doomed tragic line, in crapes and blacks and purples, sweeping by on their road to the grave. They belong to a bygone day, and none can marvel at their sombre glories without feeling that they are mourners at their own funeral—a sad lonely group, royal to the last, but swiftly sternly passing away from the world." Farrer seems to have seen them only as the ghost kings passing across the back curtain of Macbeth. And truly Iris *susiana* and *Gatesii* are unreal and unbelievable when one meets them first, monstrous blooms, larger than any other Iris I know, a pale grey, heavily veined with a purple so deep that it seems to be black. However, Iris *Hoogiana* is a beautiful pale silvery blue, a more homely flower and a reasonably possible doer. I have even seen a whole bed of it in flower outside at the Cambridge Botanic Garden. The Oncocyclus Irises are all natives of Palestine and Syria and Persia, countries with a baking hot dry period in late summer.

Of annuals the seed catalogues will tell you more than I can. Still there are a few that are superlatively good. Such are Nomophila with sky-blue flowers, *Anagallis Phillipsii* and *Phacelia campanularia*, which both have bright blue flowers with a richness which reminds us of gentian.

Gentians are the very embodiment of blue and it does not seem possible to leave out all reference to them in a chapter on blue flowers. But, alas, they do not naturally flourish on my dry sandy soil and rather dry atmosphere, and so I cannot speak with any special knowledge of their cultivation. In fact, I had originally intended to leave them entirely out of this book for that reason, together with such glories as Meconopsis, Primula, Lily and Rhododendron. Undoubtedly they are plants of personality from the cheeky violence of *Gentiana verna* to the quieter and more sedate richness of *Gentiana acaulis*. Gentians are also the symbol of mountains and from mountains we get wind and wild freedom, a peaceful contentment of spirit which seems to me only to come when we associate with forces greater than ourselves, forces made not by man but of Nature. There is more to mountain wandering and climbing than mere fresh air and exercise. It is also a release of the spirit, a freedom to soar in mind up into the infinite blue both of the gentians and the sky. A visit to the Alps without a sight of gentians would seem to me no true mountain experience. The memories of mountain ex-

peditions are some of the most precious in my life; yet while I am on the mountains they exert such a dominating influence that I have never found it possible to write fluently or otherwise about them. That can only be done in retrospect. The same is perhaps true of the great forests and it is remarkable that none of the great artists has even attempted to depict mountains or forests. There the forces of Nature are too great for the paper or the canvas, the pen or the brush. They are even greater than human attributes, the natural source of the artist's inspiration.

In a few days in the Alps in June or early July it is easy to find many different kinds of gentians. The great *Gentiana acaulis* varies in different parts of the Alps, some forms have been given specific names. Then among the grass is the little annual *Gentiana nivalis* with minute stars perhaps the most brilliant in colour of all, a veritable jewel, but, alas, a jewel which I have never seen in cultivation in England. It is an annual as is also *Gentiana utriculosa*, which often accompanies it, a beautiful species with bigger flowers, several on a six-inch stalk.

I know no flower with a more brilliant colour than *Gentiana verna*. It always seems to me a little unreal, a strange phenomenon on a grass bank. It is better seen against a grey rocky background. But they fascinate me in the same way that looking down into the depths of a crevasse fascinates me when the sun casts clear blue-green shadows disappearing into

the dark white depths below; but still that is a practice much deprecated by my guides, although they are always willing to let me stop and try and photograph *Gentiana verna*, whenever I like. It is a most difficult plant to photograph; much more so than *G. acaulis*, and I have never seen a really satisfactory picture of it. The colour and the surroundings are needed. The colour also enables us to forget how small a flower it really is; the photograph will not. Perhaps the easiest gentians for English gardens are *Lagodechiana* and *sino-ornata*, Forrest's great autumn flowering introduction. It is even now seen as a bedding plant, the ultimate tribute or the ultimate calumny.

But writing of gentians does not induce in me any great peace as do the great mountains on which they grow. It only induces in me here in Surrey a great restlessness to wander out into the garden at ever more and more frequent intervals, to go into the warm sunlight and the cool flecked shade of the little silver birch trees.

XI

THE GARDEN IN WINTER

I WRITE while there is really snow on the ground outside, real Father Christmas snow, and it is only two days from Christmas. Surely that is a triumph and the right time to write about winter-flowering plants.

The smallest winter flowers are often more precious to us than all the sumptuous beauties of the summer herbaceous border. It is in winter also that we notice most the form of trees and shrubs, the graceful feathery twigs of the silver birch, light against a dark sky, the formal pyramid of a Cypress, towering like cathedral spire or ancient round tower towards the heavens.

The recent exploration of China and Tibet has extended the number of fine winter-flowering plants, but still I think the really good winter flowerers can be counted on two hands, those whose flower buds withstand any weather and open at any gleam of sunshine. None of them are very new introductions, nor are they expensive or difficult to grow.

The two best are, in my opinion, *Jasminum nudiflorum* and *Iris unguicularis*, more generally called *Iris stylosa*. The other plants to make up my hands

are *Daphne mezereum*, *Prunus subhirtella autumnalis*, the Hellebores, *H. niger* and *H. corsicus*, the *Hamamelis mollis* and *japonica arborea*, *Viburnum fragrans* and *Chimonanthus fragrans*. I don't count in my list the Laurestinus, for although a palpable winter flowerer it is dowdy and dull and a reminder of a type of shrubbery planting dank and heavy with laurels and Aucubas that is no longer practised to-day.

The Winter Jasmine was introduced from China by Robert Fortune in the early part of the nineteenth century. He was sent out by the Council of the Royal Horticultural Society to collect plants there, and brought back a very large number of fine things.

Every year about November the long yellow buds become flushed with red on the bare green branches and open as five-pointed yellow stars. They are delicate, clean flowers, not very large but strong in colour, like a savoury rather than a sumptuous sweet. It is such a familiar favourite with all gardeners in this country that it is hard to find anything new to tell you about it. It is generally grown against a wall, South, West, East, and even North for a succession of flower. It will continue flowering from November till March, and the more its bare twigs are cut for the house, the better the plant seems to flower next year. So do not hesitate. Prune while it is in flower and enjoy the prunings; they are particularly lovely in a dark-brown chocolate vase. Don't overcrowd them, but try and form a pattern picture,

almost a Japanese decoration, so that the shadow gives you even another picture on the wall changing from every angle. If the vase could be poised so that it could swing round and round, then you could have a composition as satisfying as many of those fascinating and perfect toys of turning wire sometimes seen in Art Galleries interested in experimental work.

Miss Jekyll once suggested growing the Winter Jasmine cascading over a great rock, and for those lucky few who have great rocks in their gardens or can cascade climbers from one terrace to another, this method should be ideal. The Winter Jasmine can also be grown away from walls, and with the aid of sticks and hard pruning be made into a shapely mass extruding young shoots all round like a hedgehog. In this country I have always found that it was of cast-iron hardiness, although I have read that in American gardens it is not always a success and they sometimes resent the panegyrics which they find of it in all English gardening books.

Jasminum nudiflorum has no soft sweet scent like the common Jasmine. It is almost scentless, although strong scent is a common characteristic of winter flowers. There are few sweeter-smelling plants than *Chimonanthus fragrans*, *Daphne Mezereum* or *Viburnum fragrans*.

Even larger in flower is *Jasminum primulinum*, although this plant is not successful outside except in the warmer counties. It is, however, an excellent

plant for the cool greenhouse or conservatory, and is evergreen. It requires lots of room and looks best cascading in yellow streams from a high roof. In such a way I first saw it in the corridor of the greenhouses in the Cambridge Botanic Garden. The flowers are semi-double, about twice the diameter of those of *Jasminum nudiflorum* and the same strong clear yellow, faintly pencilled with orange towards the centre. The flowers are borne on short side shoots off the young growth.

There are also fine greenhouse species of Jasmine, *Jasminum rex* from Siam and *Jasminum gracillimum* from Borneo. Both of these have fine clusters of white flowers, but require to be grown in a heated house. The *Hortus Veitchii* records that the people in some parts of Borneo use the flowers as a perfume for the hair.

In the forest on the lower slopes of Ruwenzori, the Mountains of the Moon in Central Africa, we found a fine species of Jasmine with large clusters of white flowers, flushed faintly pink at the base. It was growing among tree ferns and the glorious wild bananas, *Musa Ensete*, which make that zone one of the most fascinating that I have ever visited. The wild banana is fairly hardy in Cornwall and this Jasmine might prove even hardier since it has a woody stem and is not a watery translucent green mass as is the banana. Unfortunately we were not able to find any seed and have not so far been able to introduce it from cuttings.

Mr. E. H. M. Cox in his account of Farrer's last journey, records the finding of a fine Jasmine with "pink buds and deliciously scented white flowers as big as a shilling". This species came from coppice at six to seven thousand feet on the mountain slopes of Upper Burma. The plant was very local and for a time it proved hardy in his garden in Scotland, although a rhododendron growing in the same situation, the fine white *R. megacalyx*, has proved very difficult of cultivation in this country. Mr. Cox, however, writes that it has not proved permanently hardy. It is not by any means certain that it is the altitude which governs the hardiness of plants imported from other countries when grown in this country. We still know little what may be the deciding factors and why some plants are so much more amenable to cultivation than others. Although gardeners experiment all the time with new species, there is also little record of their failures and only of their successes when the plant is shown before a committee or becomes generally distributed. I wish that there could be more records and integration of the successes and failures among plant introductions and the conditions under which they were tried. Still, conditions are slightly different in every garden and no one failure is proof that another attempt may not succeed.

It was only in 1914 that Farrer introduced *Viburnum fragrans* to English gardens, with seed collected in the Temple gardens of Kansu. Yet it is now one of

the most popular and widely-spread of winter-flowering shrubs and it is undoubtedly one of the best. Even in the coldest weather its round clusters of pale pink buds and white flowers seem to open and emit their wonderful scent. Its presence could certainly be discovered by any blind man. In fact, I think that a blind man, with a sense of scent, might even find more to delight him in a well-stocked winter garden than in summer.

Farrer records that he could have collected much more seed, but for a falling out with the Prince of Jo-ni who, "to avenge himself, set to and sedulously ate up all the Viburnum fruit in his palace garden and threw away the seed".

Iris unguicularis is a native of Algeria, a warm sunny land. Yet it is one of the hardiest of our winter-flowering plants and the flowers are some of the most delicate and beautiful of all Irises. They are delicate mauve in colour, the petals clear and translucent, slightly sparkling in the sunlight. The falls have a brilliant orange band running from the base to the centre of the petal, while around this is a white zone delicately pencilled with the mauve which is the main colour of the flower. The Standards are mauve, slightly flecked with purplish-crimson towards the base.

I wonder how many growers of the plant have noticed that colouring, yet to my mind the markings of the falls and the base of the standards are some of its chief beauties. The whole flower has a

delicate graceful fairy-like charm; yet it is not small, rather the opposite, for it is a good four inches across. It is also distinguished from all other Irises by the extremely long perianth tube, sometimes as long as nine inches, and by the curious processes which cover the branches of the style (those three pale forked pieces standing upright and away from the centre of the flower). Dykes in his great work on Irises, states that these are little transparent spheres poised on the top of equally transparent blunt cones. Inside the sphere there is a mass of golden grains, fine like dust, and it is these grains which give the style the curious appearance of being dusted with pale golden dust. Nowhere else in the genus Iris is this phenomenon found.

Although *Iris unguicularis* has its chief home in Algeria, it is also found in many parts of the Mediterranean, Greece, the Islands of the Greek Archipelago, Crete, Asia Minor and Northern Syria. There is also a form found on the shores of the Black Sea, which has been called *var. Lazica*.

Dykes records that the flower is dark purple and that the venation is more conspicuous than in the Algerian plant. The forms from Crete and Greece have not been given varietal names. They generally have smaller flowers than the Algerian forms and begin to flower much later in March instead of in November. There are several garden varieties. Here we have two definite mauve forms and one ivory white. The falls of this latter are rather nar-

row and the flower is not nearly so attractive as the mauve ones.

One of our mauve forms always flowers earlier than the other, often beginning in November; the flowers are a darker mauve than in the other form and they stand up well clear in bud from the sheath. The other form does not usually begin flowering till February or March. The flowers are paler mauve in colour, almost blue, and I think that the falls are slightly broader. The buds also do not rise much above the sheath and often they are almost out on the plant before they are noticed. I think that I prefer this variety, but it is valuable to have the two in order to provide a succession of flower.

Following the general custom, we have neither moved our clumps nor have we given them any manure, and they have rewarded us with many flowers. However, friends to whom we have given pieces off some of our bigger clumps, have often had good flowers off them the first year after moving and sometimes, alas, have even had them slightly earlier than ourselves.

There is a very strong and prevalent theory that the *Iris unguicularis* should never be given any manure and should be planted for best results at the edge of a gravel path. Certainly it does better in light and gravelly positions than in heavy clay soil. But I find that Dykes himself, in his great monograph "The genus Iris", advocates the encouragement of spring and early summer growth with

IRIS STYLOSA

moisture and even weak liquid manure. No more water than the heavens deliver should be given after June, when the plant should be allowed to roast as much as possible. It is still a debatable point whether it is advisable to cut back the long foliage in summer so as to allow more sun to get to the rhizomes. I have never found that it mattered very much. It is also debated when clumps should be moved, if indeed they must be moved. Probably either April or September would be the best months.

The small bulbous Irises also brighten the winter months, *I. reticulata*, *I. histrioides* and *I. Danfordiae*. I particularly like the two first species, one very common, the other still comparatively rare. *Iris reticulata* is a delicate, graceful thing in rich mauve apparel with strong orange markings, yet in spite of all the apparent frailty and delicateness the flowers stand up magnificently to frosts and winter weather. Towards the end of January the fat buds appear and in February and early March they are often in flower.

It is curious that the typical rich mauve form of cultivation is very rare in its native home in Asia Minor, while the rarely cultivated purplish-plum coloured form called *var. Krelagei* is far more common. Although, to my mind, not so beautiful as the mauve form, it is a desirable plant, since it invariably flowers a little earlier, often as much as a fortnight earlier. While a fortnight's earliness is nothing in the rich array of summer flowers, it is valuable when winter has barely turned into early spring.

Iris histrioides is a stouter plant, erect and firm like a miniature oak unbowed by the wind, as broad as it is high above the ground. The flowers are a delicate shade of blue, often almost a light porcelain blue with only a very slight tinge of mauve in it. The falls extend their halft almost horizontally, and at the end where the fall recurves downwards is a small brilliantly coloured triangular patch of white and orange. The standards are erect and they are the same shade. *Iris histrioides* flowers often earlier even than *I. reticulata*. Although it withstands the weather magnificently, it is more often seen in the Alpine house, where its flowers are safe from damage.

Although it is not a difficult plant to grow if the bulbs are purchased, it has remained rare and rather expensive, and I think this is partly due to its lack of permanency in this country as big bulbs. After flowering generally a mass of small bulbs are produced, and these need to be grown on for several years to flowering size.

Iris Danfordiae is rather a comic little fellow, very dwarf, brilliant yellow in colour and with its standards reduced to three bristles. It is one of the earliest to flower, but although not very rare, it is still somewhat expensive to buy in any quantity.

The two other early-flowering Irises, *alata* and *Vartani*, are rarely seen. Both are attractive, but probably neither is a very good doer. *Iris Vartani* comes from the hills around Nazareth, and has a

strong scent like that of almonds. The flowers are a slaty-blue in colour, but graceful like all Irises; still they have little of the strong personality of *I. histrioides* or *I. reticulata*. Their chief merit is their early flowering. Sometimes they begin in October even before the Stylosas.

I am always surprised how few grow the winter-flowering Crocus species. Many of them are very beautiful and very brilliant in colouring, and very easy to grow.

I find Farrer commented on this same neglect, and more recently Sir Arthur Hort, in his delightful book *The Unconventional Gardener*, has also tried to draw attention to the autumn- and winter-flowering species of the genus. Still, his book was published ten years ago and the recommendation may well be repeated.

They are, to my mind, far more delicate and charming than the latter flowering hybrids, and some are just as cheap.

The Crocus season really seems to bring spring into autumn and it should continue all through the winter. Although they look so frail, like the Iris just mentioned, they stand up most courageously to winter cold and storms.

The first to flower is generally *Crocus speciosus*, and it is one of the finest. The flowers are quite large, when considered by Crocus species standards rather than by Crocus hybrids standards, which are ever-expanding, until perhaps like the monstrous

Dahlias and Chrysanthemums they will burst. At any rate, it is high time that the monsters of these two latter genera did burst, and some indeed look as if they had already done so.

The flowers of *Crocus speciosus* are pale lilac-blue in colour and glory in a magnificent flaming tasselled stigma of brightest orange, standing conspicuously up in the centre of the cup like a clapper in an upturned bell. The largest variety is named *Aitchisoni*. If this crocus is once planted in the rock-garden, it should soon spread, but it is above ground for so small a part of the year that it makes an excellent companion for many other rock-plants and looks particularly fine coming up through large mats of Dianthus or other plants. It is almost a second flowering of the rock-garden in a month when there is inclined to be rather a flowerless aspect except in the patches of *gentian* and *Cyananthus*. Full sun suits this like all other Crocus species. Generally the flowers begin in mid-September and continue right through October.

As well as *Crocus speciosus* there should be *C. sativus*, *C. pulchellus* and *Crocus zonatus* flowering in September and October, while *C. iridiflorus*, a real aristocrat, carries the season through into November. Unfortunately it is still rather rare and expensive.

The flowers are large for a species Crocus. The three inner segments are smaller than the three outer ones, thus presenting a curious resemblance

to a miniature *Iris unguicularis*. The colour is a fine violet. This plant is sometimes catalogued as *Crocus byzantinus*, which gives us a clue to its native home.

All the Crocus species are natives of the Mediterranean regions and of Asia Minor. Only one species, *Crocus vernus*, is found wild in England, and that rarely, but *Crocus albiflorus* is a delight in the Alps, often flowering actually in the snow and at the edges of melting patches, white like a ghost-flower.

Winter, proper, brings in *Crocus Imperati*, *Crocus chrysanthus*, *Crocus Sieberi* and, finally, the full golden *Crocus susianus*, the real sign that spring has come, a plant of great distinction, grace and charm, as well as brilliant colouring, and as cheap, often cheaper, than any of the later flowering hybrids.

C. susianus is always one of the earliest to flower. The flowers are not very large and do not rise high above the ground, but they have a fiery golden colour which is unrivalled even by the later yellow Crocus, while the outside of the petals is tinged with a rich mahogany brown.

Crocus chrysanthus hybrids are probably the finest of the whole race and the finest of all has been appropriately named E. A. Bowles, after Mr. Bowles of Myddleton House, who is also widely known as the Crocus King. It is a beautiful rich butter-yellow in colour, almost like pale white gold, and easily the largest form. Alas, it still remains most distressingly

expensive, although he assures me that it is not in any way difficult to grow and propagates freely. Still, it is such a wonderful thing that it is worth taking some trouble over it. *Crocus chrysanthus* is one of the most variable species known. Mr. Bowles tells me that it is native to Greece, Turkey and parts of Asia Minor around Smyrna. There are yellow forms, white forms with blue featherings, cream forms and even lilac-mauve forms. There are innumberable hybrids. It is almost as variable and as interesting as the Barbata Irises in that respect. However, in all forms there is a golden throat and also the anthers bear black tips to their barbs.

Mr. Bowles himself has raised a fine series of hybrids of *Crocus chrysanthus* and has named them after birds: Yellow Hammer, Golden Pheasant, Snow Bunting, Golden Plover, Bullfinch and Siskin. The allegory is excellent for they all have a certain delicate birdlike charm. Only once did he depart from the bird names, in favour of a beautiful perky form with deeper golden bands on the yellow segments, which earned the name of "Bumblebee".

From Crocus species we should pass to the Tulips and the Narcissi, but these I reckon as the delights of spring, and reserve for a later effort.

And so in all this book I wonder whether my conception of a good plant has emerged. It is not merely a plant easy to grow; that would imply a refusal of the challenge entirely unworthy of

English gardeners, and indeed contrary to their practice.

One distinguished connoisseur, an epicure of plants, whom I had the pleasure of hearing speaking on the subject, gave his opinion that a good plant was only one in which both flowers and foliage was attractive and harmonized. I don't quite agree with this verdict. It would exclude plants such as *Meconopsis Baileyi*, where to me the flowers have such a clear glowing colour and such an intensity of impact on the beholder that the leaves are hardly noticed, although admittedly they are cabbagy. I presume also that this definition would debar also many plants flowering on the bare wood or bulbs flowering before their leaves, *Magnolia conspicua* and *Campbelli*, or even our delightful *Crocus chrysanthus*, *var. E.A. Bowles*.

I agree that leaves have great importance in our estimation of the value of a plant. Except in vast gardens, which can be sectionalized, we have to live with it throughout the year. Yet I do not think that we want constantly to be attracting attention to all parts of the garden. We don't want all parts bright together even if that were possible.

I fear that the garden which is entirely and uniformly brilliant throughout the year is an illusion and I am glad this is so. There would be no peace in it. We need variety and change and the excitement of sudden bursts of brilliance, now here, now there. To satisfy this need for variety and sudden thrills,

we need plants whose flowering really makes an impact on our imaginations as well as our eyes. To everyone such plants will be personal, and some of those which to me are personal and exciting in this way I have tried to convey as enthusiastically as I can to you in this small book *Plants with Personality*. I make no apology for the enthusiasm.

A NOTE ON

THE TEMPLE OF FLORA

or New Illustrations of the Sexual System of Linnaeus published by Dr. Robert John Thornton, a lecturer on Medical Botany at Guy's Hospital, London.

DR. THORNTON announced that he intended to make this work the most magnificent tribute ever paid to the famous Swedish botanist by illustrating his Sexual System with the finest possible prints. No expense was spared. Reinagle, Petter, Henderson and Sydenham Edwards were well-known artists of the day. The illustrations were basically printed in colour, an expensive and uncommon method. They were mezzotints and aquatints. Originally seventy prints were intended, but only thirty were issued.

Parliament gave him permission to hold a giant lottery in 1811 and to issue 20,000 tickets at 2 guineas each. The first prize, valued at £5,850, was the original paintings for *Temple of Flora*.

Later Dr. Thornton re-engraved a smaller quarto volume. The best prints were on paper watermarked 1794–1807. Less good prints were on paper watermarked 1810, and taken off in numbers for his lottery.

In a sale in London in 1893, catalogue prices of individual prints ranged from 7 to 25 guineas and nineteen were priced at 20 guineas. They are not so high now, but still retain a good value.

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Note. Owing to war service the author has not been able to consult a library in the making of this bibliography and consequently he has had to omit certain titles which might otherwise have appeared. He apologizes for any inaccuracies which may be there.

INDEX